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GILL TREMLETT

REPORT OF THE

Interregional Consultation on

METHODOLOGIES FOR HEALTH SYSTEMS AND HEALTH MANPOWER DEVELOPMENT RESEARCH

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Preamble

Health planners and administrators committed to the development of community based primary health care as the most effective means of achieving HFA/2000 are confronted by a wide variety of pressing practical problems. These include the need to assess health service needs in particular populations and to define appropriate manpower requirements, the need to create suitable training programmes and to effect their implementation, the need to select appropriate people to be trained and, through effective management, assure their effective functioning as health service personnel and, finally, the need to be aware of and assess the potential and actual impacts of this health systems planning and implementation on the target populations. This series of problems may be viewed from a number of different perspectives; for example, what are the cultural, political and economic contexts in which these problems occur? Additionally, are the specific health related concerns national, regional or with reference to city, village or individual?

The achievement of a better understanding of these kinds of problems and their effective resolution may be facilitated with the skilful use of a variety of social and behavioural science research approaches. Unfortunately, the conventionally trained researcher, health planner, administrator, and practitioner usually relates only to the limited range of research approaches that are consistent with his disciplinary roots. As biomedical researcher, sociologist, anthropologist, psychologist, economist or educator he may not be aware of a wider range of available research approaches and the utility of many of these approaches in the investigation of particular HMD problems.

It is with the need of such professionals in mind that an Interregional Consultation was held in July 1982.

The Objectives of the Consultation were the following:

1. To review the major researchable problems in Health Manpower Development and identify and describe the research methodologies which could be applied to the study of HMD research as part of Health Systems Research.
2. To identify the advantages and limitations of these different research methodologies.
3. To develop guidelines for selecting appropriate research methods for solving HMD problems and for technical assessment of research applications.
4. To identify the reasons why research methods which could be used are not being widely used at present and recommend specific actions to be taken to promote the credibility and use of these methods and where necessary determines the training requirements to meet these methods.

The meeting was organized in collaboration between the Division of Strengthening of Health Services and the Division of Health Manpower Development, Geneva, and with the Regional Office for South East Asia, New Delhi. It was opened by Dr U. Koko, Regional Director (See inaugural address in Appendix I page 67) and included 12 experts assisted by the WHO Secretariat (See list in Appendix II page 70).

The present document which summarizes the interventions and opinions of the participants during the meeting was drafted by Professor A.I. Rothman, Division of Studies in Medical Education, Faculty of Medicine, University of Toronto, Canada. It presents a wide variety of available social and behavioural science research approaches and methodologies and to do this with reference to appropriate case illustrations. A selected number of research approaches are defined and described - each with particular reference to purposes, and methodology. Criteria for their selection are indicated, their advantages and disadvantages identified, and the reader is directed to selected sources for clear and detailed instruction concerning specific methodology and application.

Since, in the HMD context, research is intended to assist the development of effective community based health systems, an improvement of communications between researchers and health planners and administrators is required. Therefore, in addition to introducing potential researchers to social and behavioural science research approaches, the document will attempt to sensitize planners and administrators to the possible usefulness of these approaches.

Introduction

The following list of assumptions is a distillation of the opinions expressed by the participants and are basic to the development of this document.

1. Problems confronted in the development of community based primary health care systems are real. If research is to be instrumental in the resolution of these problems, research approaches and designs must match these problems as they present. The problems confronted cannot be changed to conform to the specific requirements of particular research approaches and designs. It follows, therefore, that some problems or aspects of some problems may not be researchable.
2. Many HMD problems may be usefully investigated through the separate and joint use of several research approaches.
3. To deal effectively with these problems it is necessary to conceptualize them clearly and to have a thorough understanding of their social and political contexts.
4. For the types of problems encountered in HMD, research will be best planned and supervised by health care professionals familiar with a wide range of social and behavioural science research approaches.
5. Social and behavioural science research on HMD problems can sometimes provide results that will assist in effective decision-making.

THE EXPERIMENT

The primary purpose of an experiment in the social and behavioural sciences is hypothesis verification. It achieves this by testing specific propositions about associations and causal relationships; for example, that A is associated with B or that A causes B. It is assumed that through continued experimentation involving many such

variables, principles will be discovered that will lead to clearer understanding about complex social and behavioural phenomena. These principles allow prediction beyond what has already occurred and been observed. The process of experimentation, therefore, is directed at the growth of understanding through the emergence of more comprehensive and useful principles.

Methodology

In the social arena the dominant form of this research approach involves an experimental (deliberate) trial or manipulation of one variable in a situation otherwise held constant. The deliberate manipulations of the investigators are treatments and are represented quantitatively as independent variables. The consequences of the experimental treatments are outcomes represented quantitatively as dependent variables. Ideally, if the results of an experiment are to be generalized to a large group of people, (or districts, villages, families, etc.,) those actually participating in the experiment (the sample) must be randomly selected from that group. To ascribe effect to the experimental treatment the investigator must compare two similar groups who differ only with respect to the presence or absence of this treatment. The equivalence of these two groups prior to the experiment is achieved by the random assignment of people from the original sample to either treatment or non-treatment (control) groups. The absence or presence of experimental effects is usually established using the logic and methods of inferential statistics.

The distinction between the two principal functions of randomization in experimental research relating to social phenomena is worth reiterating. The drawing of a random sample that is representative of a population of interest allows generalization of research results to that population. The random assignment of subjects to groups (control and experimental) so as to ensure the equivalence of these groups is a necessary condition in drawing conclusions about cause and effect. These two randomization functions are independent and must be considered separately in the conceptualization of research problems.

Figure 1: A True Experimental Design

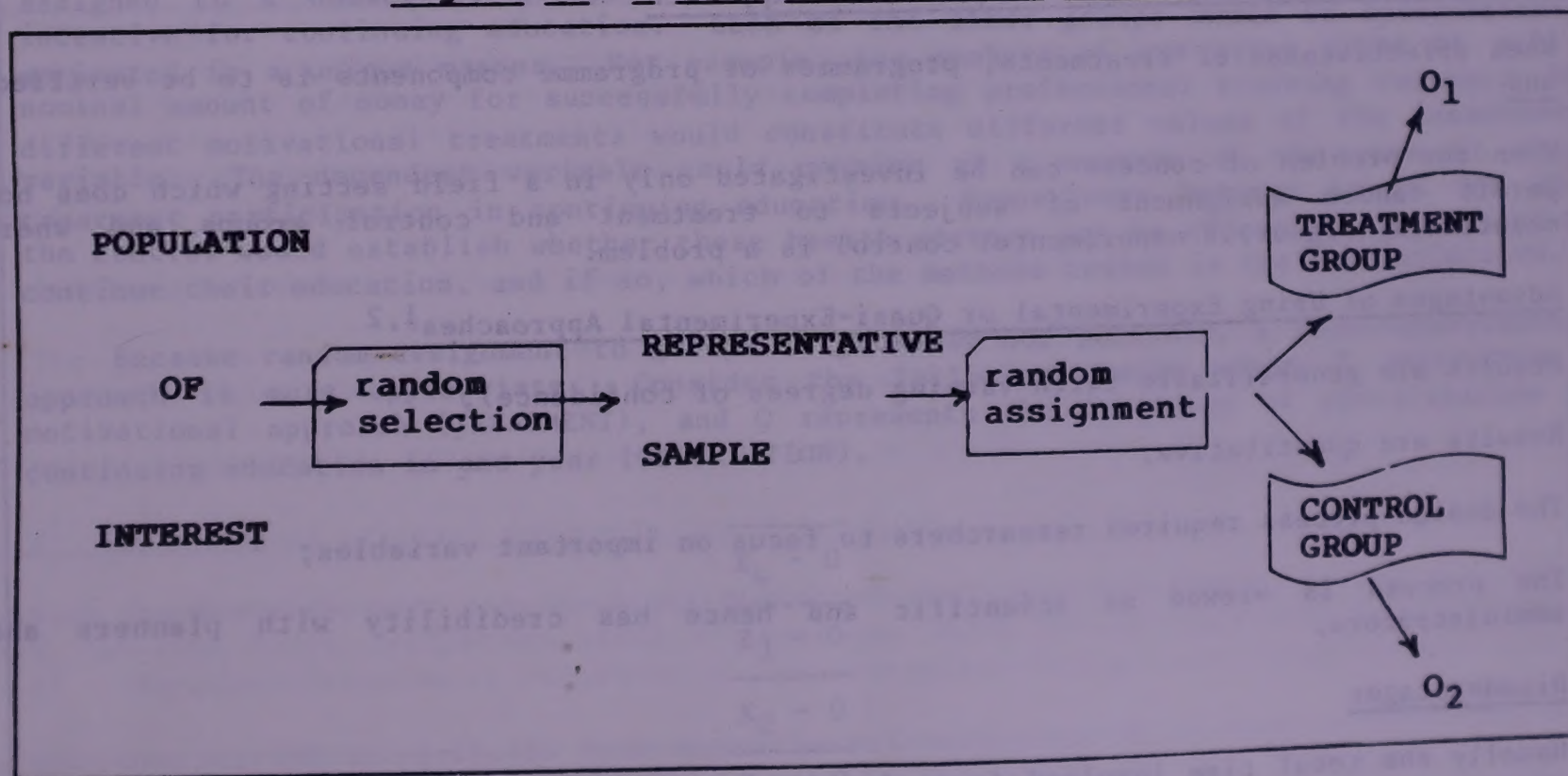


Figure 1 describes a true experimental design. In the figure, the only observations (measurements O_1 and O_2) are made after the experimental treatment.

1. Because of random assignment of subjects to treatment and control groups the two groups can be assumed to be equivalent.
2. A comparison of O_1 and O_2 will test the proposition of the presence of an experimental effect (verification).
3. Because random selection from the population of interest provides a representative sample, results can be generalized to that population.

Criteria for Using an Experiment

1. When effectiveness of specific treatments, programmes or programme components are to be verified, and
2. When random assignment is possible, and
3. When it is possible to maintain access to and to effectively separate (isolate) the treatment and control groups for the term of the experiment.

QUASI-EXPERIMENTS

In many field settings random assignment is not possible and maintaining effective experimental control is a problem. In these situations modified experimental approaches are available that attempt to accommodate for the absence of random assignment and for the various problems with experimental control. These modified approaches are called quasi-experiments. For example, instead of random assignment a matching process can be used in the assignment of subjects to treatment and control groups. With this type of design, measurements of both groups prior to the experimental treatment can be done to test the assumption of treatment - control group equivalence.

The purposes of quasi and true experimentation are essentially the same.

Criteria for Selecting a Quasi-Experimental Approach

1. When effectiveness of treatments, programmes or programme components is to be verified, and
2. When the problem of concern can be investigated only in a field setting which does not permit random assignment of subjects to treatment and control groups and where maintaining rigorous experimental control is a problem.

Advantages of Using Experimental or Quasi-Experimental Approaches^{1,2}

1. Results are generalizable (with varying degrees of confidence);
2. Results are quantitative;
3. The design process requires researchers to focus on important variables;
4. The process is viewed as scientific and hence has credibility with planners and administrators.

Disadvantages

1. Usually the total time involved from planning to reporting is considerable. Therefore, when decisions have to be made rapidly experiments are not suitable;
2. Experiments in field settings require high levels of expertise for competent design, implementation, analysis and reporting;
3. The analysis of data can require sophisticated computing equipment;

4. Experiments are dependent on accurate measurement. When the researcher's interest is in complex social phenomena, the development of valid measurement techniques can present serious problems that are both time consuming and costly to resolve.
5. Experiments are insensitive to outcomes not explicitly anticipated in the research design;
6. Results of quasi-experiments done in field settings may be difficult to generalize across time and to other contexts;
7. Intentionally manipulating health related factors for purposes of experimentation in field settings can raise difficult ethical problems.

Reporting

Reporting of a true or quasi-experiment requires first a precise definition of the research problem placed in the context of what is already known. Second, precise descriptions of the populations of interest, the sampling procedures, the research design (see Figure 1), the methods of observation (measurements) and the methods of data analysis are needed. Third, a summary of the data along with the results of the data analysis are necessary. These results are then described, explained and placed in the context of the "larger body of knowledge".

The writing style is impersonal, precise and is intended to provide an impression of scientific objectivity. The major virtue of the well written report is that it presents as an honest, unambiguous accounting of the experiment in sufficient detail so as to permit replication.

An Example

What is the best way to stimulate a particular category of health workers in a given geographic region to continue their own education?

Ideally, health workers in the category of interest in the region would be randomly assigned to a number of groups. One group, the control, would not be given any incentive for continuing education. Each of the other groups would be systematically motivated in a unique manner. For example, the members of one group might be paid a nominal amount of money for successfully completing professional training courses. The different motivational treatments would constitute different values of the independent variable. The dependent variable could consist of a measure of the rate of after treatment participation in continuing education. Comparisons between groups and with the control would establish whether these health workers can be effectively motivated to continue their education, and if so, which of the methods tested is the most effective.

Because random assignment to groups is probably not possible, a quasi-experimental approach is more appropriate. Consider the following design where X represents a motivational approach (TREATMENT), and O represents the frequency of participation in continuing education in one year (OBSERVATION).

X₄ - O

X₃ - O

X₂ - O

X₁ - O

- O (no treatment)

These groups of health workers have not been randomly formed. The researcher has attempted to achieve group equivalence through matching and assumes that differences in the observations after a period of one year are attributable to the treatment differences. However, because there have been no determinations of pretreatment continuing education activity, observed differences after one year may be due to inherent group differences in spite of the matching or to the treatment effects or both. Moreover, if there are no noticeable differences in the observations after one year, the researcher will have difficulty attributing this to the ineffectiveness of his motivational treatments, for this result may also be due to communication between the experimental groups (this is called contamination and reflects lack of experimental control).

If the researcher had prepared for this investigation prior to initiating the different motivational approaches, the following design may have been more appropriately used.

$O_1 - X_4 - O_2$	

$O_1 - X_3 - O_2$	

$O_1 - X_2 - O_2$	

$O_1 - X_1 - O_2$	

O_1	O_2 (no treatment)

As before, the health workers have not been randomly assigned to the experimental and control groups. However, by comparing the groups prior to treatment (by comparing the O_1 values), the researcher is in a better position to identify the impacts of the different motivational approaches. In each of these designs precise descriptions of the methods used to form the experimental and control groups of health workers are essential.

Other Example Problems

- To assess the effectiveness and impacts of learning objectives on the training of health workers.
- To determine the optimum time required to train personnel for the actual work they do as health workers.
- To evaluate the suitability of learning materials used in the training of health workers.
- To evaluate the effectiveness of a programme for the training of health workers.
- To identify the most effective means of disseminating information including research findings.

Ideally, each of these examples might be investigated using a true experimental design. In practice the investigation of these problems in their respective field settings will probably require quasi-experimental designs.³

A published account of a randomized (true) experiment relating to HMD is provided as further illustration. It describes the assessment of the effects of substituting nurse practitioners for physicians in primary care practice. This publication has been chosen because it involves an important and complex HMD problem that has been clearly conceptualized by the researchers. The research design is appropriate to the problem and the measurement procedures have apparently been competently developed and employed. The report is brief but complete and the descriptions of the research problem, research sample,

methodology and results are clear. The discussion links the results not only with the developing body of knowledge concerned with primary health care delivery but also with the actual context of the study, the health care system in Ontario, Canada⁴ (see Annex I). A published description of a quasi-experiment relating to HMD and involving the following design

$$\frac{O_1 - X - O_2}{O_1 \quad O_2 \quad (\text{no treatment})}$$

is also provided. In this study subjects were not randomly assigned to control and experimental groups, but an attempt was made to achieve group equivalence by matching. The purpose of the research was to evaluate a workshop on rehabilitation in psychiatry for health professionals involved in rehabilitation⁵ (see Annex II).

THE SAMPLE SURVEY

A sample survey is used to gain knowledge about a population by systematically gathering information from a representative sample of that population using survey techniques (e.g. questionnaires, interviews). The primary purposes of sample surveys are to describe and explain. For example, with reference to a large group of people, sample surveys are capable of describing health care needs, the use of health services, the effects both anticipated and unintended of health care, and the acceptability of health services. In addition, sample surveys can contribute to the understanding of health care issues. For example, a sample survey can be used to explain why a particular group of people does not make better use of available health care facilities, and why certain aspects of health care organization in a particular region interfere with primary care delivery. In general, the analytical purpose is achieved by formulating and testing hypotheses about relationships between variables of interest to the researcher.

It is worth noting that investigations involving sample surveys may also have educational and social development functions. For example, a survey may stimulate public interest in a particular topic - public interest that will lead to desirable public or community action.

Methodology⁶

A sample survey achieves its descriptive and/or analytical purposes by systematically collecting data and by providing statistical summaries of these data. Data are collected by administering structured interviews and questionnaires to a sample of people drawn from a population of interest.

Briefly, the steps in this research process are as follows:

1. The research problem(s) is/are identified and conceptualized. Research objectives are defined;
2. Planning includes:
 - a) a search of relevant documents and literature;
 - b) the identification and description of the population of interest;
 - c) the identification of variables of interest;
 - d) the determination of the most appropriate sampling approach;
 - e) the selection and preparation of appropriate measurement approaches and materials;
 - f) the definition of hypotheses to be tested.

3. Data collection procedures and materials are pretested;
4. The data are collected, processed and analyzed.
5. The results of the investigation are reported.

It is important, if possible, to involve the authorities who have commissioned the study in the planning process so as to increase the probability of their appropriate reaction to the study's results.

Criteria for the Selection of a Sample Survey

1. When a description of what exists or is happening in a population is required;
2. When an explanation of what is happening in a population is required but for practical reasons experimentation is not possible. For example, when programme changes are occurring and periodic monitoring is required; when a programme to be evaluated operates nationally, thus eliminating the possibility of finding a representative control group; when a programme to be evaluated is in process with no preprogramme measures available.

Advantages

1. If programme assessment results are required by health planners or administrators, useful information can frequently be provided more quickly by using survey methods than by experimentation.
2. Descriptive and analytical procedures allow for precise statements of results of sample surveys.
3. A sample survey can identify and quantify unintended outcomes of health care in a population.

Disadvantages

1. Sample surveys require highly trained personnel as well as significant technical, administrative, data processing and clerical support.
2. Data from sample surveys tend to be viewed as "soft" by health planners and administrators.
3. If interviews are used, procedures for minimizing interviewers' biases and eliminating dishonesty are required.
4. Extensive pretesting is required to assure the validity of data collection methods.
5. The conclusions of a single sample survey are at best only tentative predictors of what might happen at another time and in another place.
6. A single sample survey is limited in its ability to deal with questions of social change.

Reporting

The remarks that appear earlier about reporting the results of experiments apply equally to sample survey research.

An Example

As part of the process of regional health planning, a national health ministry requests some guidance in defining the financial resources to be assigned to the continuing education of several categories of non-physician health workers involved in community based primary health care delivery.

This example presents several distinct research concerns. These include, for example: "How effective are the different categories of health workers in coping with the actual demands and prescribed responsibilities of their jobs?" That is, are there deficiencies in job performance that continuing education might remedy? Another is "How successful are present continuing education programmes in assuring the effective functioning of these health workers?"

It is probable that regional epidemiologic data and the results of on-site supervision and assessments will identify areas of strength and/or weakness in the performance of these workers. A sample survey of the workers may be used as one approach in assessing the effectiveness of the present list of continuing education programmes.

The population of interest consists of 'n' thousand health workers in 'N' categories concerned with the delivery of primary health care at the community level. A sample that includes proportional representation from each of the 'N' worker categories in each of the region's administrative districts is required. In considering this research problem, useful variables might include, for example: past and present participation in continuing education, participation incentives, convenience (distance and time), relevance to job, characteristics of instruction, quality of instruction, instructor characteristics, and participant biographical information such as age, sex, marital status, size of immediate family and extent of family responsibilities.

A questionnaire administered personally by local supervisors (with some modest training) could be an effective means of collecting the required data.

Beyond the descriptive aspects of the study, understanding of the situation could be facilitated by testing a series of hypotheses. Examples of these are:

1. workers prefer continuing education programmes that are obviously relevant to their jobs;
2. workers prefer continuing education programmes where attendance causes the least personal inconvenience and cost;
3. explicit incentives (e.g. payment) increase participation in continuing education programmes;
4. instructors who are recognized as from the region are more effective instructors than those from elsewhere.

Other Example Problems

- An inventory of present health manpower is required that describes the functions and activities of each manpower category in the region involved in community based primary care.
- What are the legitimate health needs and wants of the people in a particular community?
- In a particular region how are private medical practitioners used in the training of health workers?
- What are the consumers' perceptions of the functions of health care teams?
- What are the impacts of a rural based training programme for health workers?

A published account of a sample survey is provided as illustration. The article describes the evaluation of family planning communications in El Salvador. This illustration is particularly useful in that in addition to providing a clear description of a well-designed and administered sample survey, the authors explain why a sample survey rather than an experiment was the more appropriate research approach for this situation⁹ (see Annex III).

THE USE OF DOCUMENTARY SOURCES

The primary purposes of using research approaches based on documentary sources, as with sample surveys, are description and explanation. The key distinctions can be found in the different perspectives of the two research approaches. First, documents provide the best means of studying past events while sample surveys are concerned with describing the present. Additionally, research based on the secondary analysis of information in documents involves the production of information about topics other than those which were the concerns of the original research. Research using documentary sources can be broad in scope or focussed, and either quantitative and objective or qualitative and subjective depending on the aims of the research and the nature of the source materials available.

Methodology

Documents commonly available to the researcher include:

1. Official statistics (e.g. census data, mortality and morbidity data, utilization data) and other official documents (e.g. legislation, parliamentary or legislative minutes);
2. Academic and professional materials (e.g. journal publications, scholarly texts, archives, data banks);
3. Popular materials (e.g. newspapers, advertisements, telephone books);
4. Personal documents (e.g. memoirs, diaries, letters).

When the original data are quantitative, the whole range of statistical techniques available to the social scientist may be legitimately used. However, the researcher must be aware of the definitions of the data used in the original documents and how the data were collected and processed. In addition, he must be able to assess its validity (that it actually represents what it is supposed to represent) and reliability (precision).

A variety of research designs involving the secondary analysis of data from documentary sources are available to the researcher. These include, for example:

1. The pooling of data from multiple sources;
2. Trend analysis;
3. Cohort analysis;
4. Crosscultural comparisons¹⁰

Materials with qualitative data may also play an important role. For example, analyses of personal documents can provide valuable information about the living conditions experienced by individuals or social groups, as well as their attitudes related to the social issues of the day, their social awareness, and their important life events. In addition, content analysis of what appears in the mass media can provide the researcher with reflections of the state of social awareness in relation to emerging social problems. Analysis of changes in the contents of the mass media can provide the researcher with an indication of how these social positions have changed over the time.

The value assigned to data and the results of analysis should not be dependent on their respective forms (quantitative or qualitative). Too often, both researchers and the consumers of research results consider qualitative work inferior to work that is quantitative.

Criteria for the Use of Documentary Sources

1. The use of documentary sources may be the only approach available to the researcher that can deal with certain kinds of problems. For example, medical audits require the use of patient and hospital records; when the scope of the problem precludes the actual collection of data (e.g. to describe the relationship between national incomes and health); when the problem refers to events that have occurred in the past (e.g. a retrospective study of national or regional trends in the prevalence of a particular disease).
2. A review of available documentary sources can provide a summary of the state of knowledge in a given area, and should be an early step in introducing a researcher to an area of activity new to him. It should be assumed that a researcher will be aware of existing documentary information relating to his work, irrespective of the research approach he commonly uses.

Advantages

1. Large amounts of data from both official and private sources may be available to the researcher. The quantity and quality of data in archives is growing. Access to stored data is being facilitated by the advent of computer-based data and information retrieval systems.
2. Important advantages of this approach are its economies of time and resources. These, along with the "essence" of respectability associated with published documents, make this an attractive approach for health planners and decision-makers.
3. Secondary analysis of existing data is particularly useful when the collection of new data (e.g. with a survey) in a given situation will be intrusive.
4. This type of research can be done by an individual researcher. It does not require the collaborative interaction nor the extensive funding characteristic of large research groups.
5. Because of the low costs associated with research of this kind and the vast array of available and accessible documentary sources, secondary analysis provides a powerful alternative avenue for the training of HMD researchers.
6. Through the secondary analysis of data from different countries the researcher may examine problems in a comparative way. By considering data from different time periods the researcher may investigate change.

Disadvantages

1. Required documents may not be available to the researcher.
2. In some countries it is not unusual for official documents containing, for example, vital statistics, manpower data and hospital records to be incomplete and/or inaccurate.
3. Secondary reporting can add respectability to inaccurate primary sources of data.
4. Because a large number of different people contribute information to personal records (e.g. hospital, educational, work) over an extended period of time, the data in these records usually have low reliability.

Reporting

The remarks provided earlier about reporting the results of experiments apply equally to research using documentary sources.

An Example

Several district health science institutes offer two year training programmes for health workers in a number of different categories. Each of the programmes can be entered by people with a minimum of one year of secondary school education. Participation by both young and mature people is encouraged. Students who complete just the first year of a programme receive "level one" certification. Students who successfully complete the second year receive "specialty" certification. People certified at each level are in great demand in the National Health Service. Information relating to the numbers of students entering and successfully completing the programme is required by a national health manpower planning committee.

Relevant available documents include registration data for several years, year end class performance summaries (examination results, field experience assessments, numbers of drop-outs), and individual student records (grades and biographic information).

From the data available, tables may be prepared that describe the numbers of registrants, and the numbers of students successfully completing first and second years respectively for several successive cohorts of students. These tables should include descriptions of the system in total and of each of the health science institutes and should satisfy the requests of the manpower planning committee.

There are, moreover, other questions that can be easily addressed. These include, for example:

1. Which students have the better chance of successfully completing the first year, the second year? (male or female, young or mature students, single or married students)
2. Are the entrance criteria and standards adequate?
3. Are the schools operating at or near capacity?
4. Are there trends in yearly registrations and drop-out rates by institute or in total?
5. What are the grade distributions for the formal and the field experience parts of the programmes at each institute and in total?

Other Example Problems

1. What are the influences of existing professional bodies (e.g. national certification bodies) on professional training programmes?
2. What are factors responsible for the migration of health manpower to more affluent countries?
3. What are the costs associated with the training of non physician health workers in rural and urban settings?
4. What is the current distribution of national health manpower?¹¹

Two published articles are provided as illustrations. The first uses published articles in professional journals to summarize the situation of acute diarrhoea in the developing world. The author's analysis of the previously published information substantiates the present accepted positions concerning the prevalence of this problem, the care and treatment of those who are ill, and longer term effective preventive measures¹² (see Annex IV).

In the second article, relationships between national incomes and health in the third world are examined and predictions are offered concerning future health status based on the observed trends. For this analysis the author has used data from publications of the World

Bank and the World Health Organization. He concludes by commenting on the potential role of quantitative policy analysis (the analysis of national economic indicators such as national income, gross national product and gross national expenditure) in the formulation of national and international health programmes¹³ (see Annex V).

CASE STUDIES

A case study is a study of a "bounded system" (the case) that can be conceived of as a whole or complete entity in itself. Examples could include: a study of health care in a rural village; a study of the consequences of introducing a recently trained health worker into a rural village; and a study of a particular training programme for health workers. The primary purposes of a case study are to gain indepth knowledge and understanding of the case and not necessarily generalization beyond the case. The goal of generalization can be addressed with reference to experiences gained in the study of many cases. The major distinctions between a case study and other research approaches relate to focus. In a case study the concern is with the case (a person, village, system, programme, organization, etc.) and not with a population. Furthermore, the process of investigation is directed at understanding and maintaining the wholeness of the case and not at its dissection into discrete variables or factors.*

Methodology

Depending on his conceptualization of the problem the researcher is free to use any available research methodology from quantitative measurements and analysis to qualitative observations and descriptions. However, more often than not, field-based case studies involve an anthropological approach called ethnographic research. Using this approach, the researcher is usually a participant observer interested in impressions, descriptions and understanding as opposed to the results of measurement. He usually works alone and stays "in the field" long enough to witness or participate in a complete cycle of events. The researcher establishes the validity of his impressions by verification with a variety of information sources (triangulation). In addition to functioning as a participant observer, he may use structured or unstructured interviews, administer surveys and draw information from documentary sources. However, qualitative observations are the most frequently used sources of data and can present the inexperienced researcher with major problems of interpretation and summary.

In brief, the researcher examines a complex, dynamic, bounded social system. In the process of data gathering and interpretation he looks for patterns, connexions, trends, etc., that correspond with or suggest substantive modifications to his present views of the research problem.¹⁴

Criteria for the Selection of a Case Study

1. When a problem arises that is specific to a given situation;
2. When indepth information and understanding about people, social systems, and social phenomena are required;
3. When descriptions of the actual impacts of introducing a new programme are required;
4. When planning a new programme for use with people of a particular social system or culture;
5. A case study can serve as the pilot phase for a more extensive study that uses other research approaches.

* The "case study" approach to research in social science should not be confused with clinical or epidemiologic "case reports" or "case-controlled studies".

Advantages

1. In the development of community-based primary care systems or related health manpower training programmes, problems are usually of a scale that is compatible with the case study perspective. For example, anthropological field work may be the only approach that will lead to an understanding of the village; an understanding that is essential to the planning of rural primary health care.
2. Because of its focus on people, the field-based case study is ideologically suited for research on community-based primary care systems. That is, in the establishment of such systems people should have primacy. The system must not be imposed from above but should reflect the people's needs. Therefore, fieldwork is needed to find out about the people who are to be served.
3. Case studies provide for direct study of social phenomena (the researcher sees what people are doing rather than what reports say they are doing).
4. Reports of case studies have both cognitive and emotional appeal. Readers relate to the individual human events that are described.
5. The case study approach has a natural appeal in that the researcher (and hence the reader) learns by experience rather than by experiment.
7. Case studies of two or more similar situations will allow comparisons and can thus be used as a partial substitute for experimentation.

Disadvantages

1. Case studies tend to be viewed by administrators as too descriptive, too wordy, hard to evaluate, impressionistic, scholarly and too esoteric.
2. Because this research process is lengthy, results are difficult to immediately relate to decision-making. This is particularly true with reference to policies that are changing rapidly.
3. A case study may be difficult to sustain over the time period required to capture sufficient understanding of the case situation.
4. Qualitative data are difficult to interpret and difficult to explain to health planners and administrators.
5. Case or problem boundaries are difficult to define.
6. There are few available competent field researchers.

Reporting

As with the research approaches described earlier, the researcher has an obligation to provide in his report an honest and clear description of his study's conceptualization and methodology in sufficient detail so as to permit replication. However, in addition, the story about the case should be told in sufficient detail and with sufficient skill so that readers achieve understanding partly through cognitive processes and partly by experiencing the individual events.

An Example

A district health department has proposed that village health workers be assigned to serve villages (from 100 to 400 families) remote from the district's centre of population. Prior to full scale implementation of this plan, it is proposed that a health worker be introduced in a selected village and that this process and its impacts be investigated.

In this case a researcher with field experience might usefully visit the village for several weeks prior to the assignment of the health worker to:

1. gather information relevant to health service planning (e.g. village demographics, mortality and morbidity information, the states of personal and community hygiene, how and by whom care for the sick and injured is provided);
2. determine the social structure of the village (e.g. how and by whom is the village governed, what are the nature and extent of kinship relationships);
3. initiate discussions with those in authority to determine their perceptions of the prevailing village health problems, introduce the district department's health service priorities, and negotiate terms, roles, and responsibilities for the proposed health worker that are acceptable to the village and consistent with the department's objectives.

Once the assigned health worker establishes residence in the village, the researcher should visit frequently until he is confident that the new worker's situation is stable. In this interval the researcher may gather impressions from the village leaders, elders, and those other villagers he has identified as knowledgeable as well as from the health worker. In addition, he may observe the health worker at work. Weekly or bi-weekly reports to the district health department can keep the planners abreast of the situation in the village as it develops, permit adjustments if and when necessary, and finally, provide a detailed written accounting of the pilot case.

Other Example Problems

1. How is training combined with the delivery of services in a given community?
2. How does a community use the existing health services?
3. How is learning about health encouraged in "the Asian cultural environment"?
4. What is the impact of private practice in teaching health care institutions and their teachers?
5. How do currently operating health teams work? What are their functions? What are the hierarchical relationships of team members and how do these affect team functioning¹⁵

Two published accounts of field based case studies are provided for illustration. The first is a description of primary health care in two rural villages in Saudi Arabia¹⁶ (see Annex VI). This report is included because its perspective is scientific, and the information it conveys is mainly quantitative. The research may be legitimately viewed as a case study because the main interest is with a bounded system (primary care in two villages) that is investigated to gain understanding of that system and not for the purpose of generalization.

The second example, taken from the book Poverty, Class and Health Culture in India by D. Banerji illustrates the conventional anthropological approach to field-based case study and reporting. It includes an introduction to the book's major concern and its conceptualization (pp.1-3) and one particular case study (the case of Suryakanta Mukherjee, pp.62-66) that the author uses to establish and describe a picture of the social structure of a rural West Bengali village.¹⁷

PROMOTING THE CREDIBILITY OF SOCIAL AND BEHAVIOURAL SCIENCE RESEARCH

If health planners and administrators are to incorporate the results of social research in decision-making:

1. This research should focus directly at the real problems confronted in the developments of effective community based primary care systems;

2. The research should be properly conceptualized and executed;
3. In writing his report, the researcher must keep in mind the specific needs of health planners and administrators. For example:
 - a) Discipline-related jargon should not intervene between administrators and useful research results;
 - b) Research results should reach the appropriate administrators quickly;
 - c) Results should be described and explained with reference to specific problems.
4. Health planners and administrators must be sensitized (through educational efforts) to:
 - a) the appropriate uses of social and behavioural science research approaches;
 - b) the past successes and hence the future usefulness of these research approaches.
5. When possible, health planners and administrators should be involved in the planning, execution, and reporting of the research related to the problems described in item (1).

TRAINING

Goals and Objectives

The ultimate success of a programme in promoting the appropriate and effective use of behavioural and social science research requires:

1. The training of medical and other health personnel in the elements of applied social research. The goals of this training will be to provide personnel with an appreciation of the use of, or in some cases capable of using, a variety of social research approaches in the solution of problems associated with the development of community-based primary care systems.
2. The orientation of health planners and administrators to be effective consumers of the results of applied social research. The goals of this orientation will be to make planners and administrators familiar with the variety of social research approaches available, capable of making reasonable and informed requests of the researchers and also making informed assessments of research proposals submitted by researchers, capable of participating in the process of planning and possibly executing this research in collaboration with researchers, and capable as administrators of translating the research results into effective actions in the development of community based primary care systems.
3. The orientation and training of social and behavioural scientists for active and useful roles in health service research and HMD research.

The training goals for the researchers and health planners and administrators probably have only limited areas of overlap. An example of a common goal is the need to sensitize each group with the other's roles, responsibilities and needs. Learning objectives related to common goals could be addressed through joint learning experiences. However, it is anticipated that, in the main, two separate levels of training will be needed with each addressing its own set of learning objectives.

Research Training Objectives

Given a problem related to the development of community based primary health care, the participant will:

1. Select an appropriate research approach and justify his selection by demonstrating the match between the problem as conceptualized and the approach selected;

2. Propose an appropriate research design and also describe the methodologies to be used. The participant will justify his design with reference to the original problem as conceptualized.
3. Estimate the resources (people, technology and finance) and time required to execute the proposed research;
4. Demonstrate that the research proposal will satisfy the needs of the health planner or administrator.

Orientation Objectives

Given a health problem with implications for health manpower development, defined with reference to a particular context (geographical, political, social) and requiring administrative action, the participant will:

1. Redefine the problem in terms of a series of specific research problems;
2. Rank order the research problems in order of their relative importance in informing decision-making;
3. Provide a schedule for the planning, executing and reporting of the research;
4. Assign resources (people, technology and finance) assuming strictly limited amounts of each;
5. Describe the nature and extent of his own involvement and the responsibilities of the researcher(s);
6. Provide a copy of his instructions to the researcher(s).

In addition the participant will:

7. Provide a detailed evaluation of a research proposal requesting permission and funding for the project related to the development of a community-based primary care system. This evaluation should consider:
 - a) The value of this project to planning and administrative needs;
 - b) The conceptualization of the project as a research problem;
 - c) The appropriateness of the research approach and methodology;
 - d) An assessment of the resource estimates.

PROGRAMME PLANNING

As an initial step it is proposed that a group responsible for programme planning and implementation be established (at an appropriate level and location - WHO/HMD Geneva or SEARO).

Programme planning should proceed with reference to the following assumptions:

1. Training (orientation) experiences should be problem-based and experiential not discipline-based and didactic;
2. That the training goals are to produce applied social researchers and research administrators useful to and committed to the development of community-based primary care systems;
3. That the achievement of these goals will require systematic training/ orientation of participants over extended periods of time.

A training/orientation programme might include, for example, on-the-job or internship involvement with research and/or research management with supervision by appropriate personnel. The level of participant responsibility and involvement would increase as training/orientation progresses. In addition, it could involve periodic participant meetings or workshops for purposes of focussing, maintaining continuity, considering participant problems, group support, and the consideration of progress reports and case materials.

The resources required would include trainers and resource people selected from the pool of available academic researchers and health administrators. These people should be committed to the development of community-based primary care systems as the appropriate path to HFA/2000, and should have research and/or administrative views consistent with those expressed at the Inter-regional Consultation summarized in this document. It is assumed that it will be possible to orient the trainers and resource people to the programmes' goals and learning approaches. Needed also would be illustrative materials from journals, reports, and books. It is suggested that the development of appropriate problem-based case materials be encouraged. Finally, a wide range of available internship positions would be needed.

GLOSSARY

1. Research approach: the generic term, e.g., experimentation, quasi-experimentation, case study.
2. Research design: the unique adaptation of a research approach to a particular situation, e.g. the post-test only, and pre- and post-test designs described in pp. 5-6.
3. Research methodologies: the measurement, observation, calculation, interpretation, etc., procedures used in executing the research.
4. Variable: any representation of a trait or characteristic (of a person, group, system, etc.) that is capable of assuming different values.
5. Matching: in an experimental design when random assignment of subjects to groups is not possible, subjects may be assigned so that group equivalence with respect to certain key variables is assured. For example, matching on the variable "sex" would assure equal proportions of males and females in each group.
6. Cohort: a group of people having a statistical factor in common (e.g. membership in a particular training class).
7. Inferential statistics: the branch of statistics that treats sample data for the purposes of generalization.
8. Secondary analysis: the analysis of data from documentary sources.
9. Data collection: quantitative (measurement processes); qualitative (observations, interviews, anecdotes, minutes).
10. HFA/2000: World Health Organization declaration from 1978 Alma Ata Conference "Health for all by the year 2000".
11. HMD: health manpower development.

REFERENCES

1. Comprehensive and clear descriptions of experimental and quasi-experimental methodology can be found in D.T. Campbell and J.C. Stanley, Experimental and Quasi-Experimental Designs for Research, Chicago: Rand McNally & Co., 1966. A more recent and extensive treatment of quasi-experimentation can be found in T.D. Cook and D.T. Campbell, Quasi-Experimentation: Design and Analysis Issues for Field Settings, Boston: Houghton-Mifflin Co., 1979.
2. A relatively simple introduction to the range of statistical techniques commonly employed in true and quasi-experiments can be found in J.P. Guilford, Fundamental Statistics in Psychology and Education (4th edition), New York: McGraw-Hill Inc., 1965. A description of statistical techniques specific to quasi-experimental designs is presented in "The Statistical Analysis of Data from Nonequivalent Group Designs", Ch. 4 (pp. 147-202) in the book by Cook and Campbell listed above.
3. These problems have been selected with minor modifications from a much larger list that was included in an Annex to the Report of the Regional Director on the Research Study Group meeting on Health Manpower Development, 8-11 August, 1978, New Delhi, SEA/RES/14, SEA/Med.Educ./344, 12 February 1979.

4. W.O. Spitzer, D.L. Sackett, J.C. Sibley, R.S. Roberts, M. Gent, D.J. Kergin, Brenda C. Hackett and A. Olynich, "The Burlington Randomized Trial of the Nurse Practitioner". New England Journal of Medicine 290: 251-256, 1974. (Annex I)
5. E. Richards, J. Hill-Tout, N. Berry, R. Hassall and D. Griffiths, "An Evaluation of a Rehabilitation Workshop". Medical Education, 14, 36-40, 1980. (Annex II)
6. A simple introduction to sample survey research design and methodology is provided in J. H. Abramson. Survey Methods in Community Medicine (second edition), Edinburgh: Churchill Livingstone, 1979. More thorough and comprehensive treatments are offered in C. Moser and G. Kalton. Survey Methods in Social Investigation (second edition), London: Heinemann Educational Books, 1979; and R. Anderson, J. Kasper, M.R. Frankel and Associates. Total Survey Error, San Francisco: Jossey-Bass, 1979. Useful instruction about questionnaire design can be found in A.N. Oppenheim. Questionnaire Design and Attitude Measurement, New York: Basic Books, Inc., 1966.
7. See "Sampling Methods" (Ch.8) in J.H. Abramson for a simple introduction to the topic sampling. For a more detailed treatment see W.G. Cochran, Sampling Techniques (second edition), New York: John Wiley, 1963.
8. Taken with minor modifications from Annex to WHO Document SEA/RES/14, SEA/Med.Educ./344, 12 February 1979.
9. J. T. Bertrand, J.D.A. Zelaya, D.J. Cisneros and L. Morris. "Evaluation of Family Planning Communications in El Salvador". International Journal of Health Education, Vol.XXIV, No.3, 1981, pp.183-194. (Annex III).
10. These and other designs are described in detail with reference to example case studies in H.H. Hyman, Secondary Analysis of Sample Surveys: Principles, Procedures and Potentialities, New York: John Wiley & Sons, Inc., 1972. A simple introduction to this research approach can be found in "The Use of Documentary Sources" (Ch.5) in J.H. Abramson.
11. Taken with minor modifications from Annex to WHO Document SEA/RES/14, SEA/Med.Educ./344, 12 February 1979.
12. H. Nazer, "Acute Diarrhoea in the Developing World", Journal of Tropical Pediatrics, 1982, 28, 1-4. (Annex IV)
13. G.E. Cumper, "National Incomes and Health: Implications of some Recent Additions to the Data", Journal of Tropical Medicine and Hygiene, 1981, 84, 49-61. (Annex V)
14. An introduction to design and methodology in field-based case studies can be found in L. Schatzman & A.L. Strauss, Field Research, Englewood Cliffs, N.J.: Prentice-Hall Inc., 1973. See also "Field Studies" (Ch.2) in M. Golden (editor), The Research Experience, Itasca, Illinois: F.E. Peacock Publishers Inc., 1976. For an introduction to ethnography (field work) see M.H. Agar, The Professional Stranger, New York: Academic Press, Inc. 1980.
15. Taken with minor modifications from Annex to WHO Document SEA/RES/14, SEA/Med.Educ./344, 12 February 1979.
16. Z.A. Sebai, "Primary Health Care in the District of Al Asiah" in Z.A. Sebai (editor), Community Health in Saudi Arabia: A Profile of Two Villages in Gasim Region, Saudi Medical Journal Monograph No. 1, 1982, 71-76. (Annex VI)
17. D. Banerji, Poverty, Class and Health Culture in India, New Delhi: Prachi Prakashan, 1982.

ANNEX I

- i -

THE BURLINGTON RANDOMIZED TRIAL OF THE NURSE PRACTITIONER

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Abstract From July, 1971, to July, 1972, in a large suburban Ontario practice of two family physicians, a randomized controlled trial was conducted to assess the effects of substituting nurse practitioners for physicians in primary-care practice.

Before and after the trial, the health status of patients who received conventional care from family physicians was compared with the status of those who received care mainly from nurse practitioners. Both groups of patients had a similar mortality experience, and no dif-

ferences were found in physical functional capacity, social function or emotional function. The quality of care rendered to the two groups seemed similar, as assessed by a quantitative "indicator-condition" approach. Satisfaction was high among both patients and professional personnel. Although cost effective from society's point of view, the new method of primary care was not financially profitable to doctors because of current restrictions on reimbursement for the nurse-practitioner services. (N Engl J Med 290:251-256, 1974)

THE concept of using nonphysicians to provide primary health service has seldom been accompanied by quantitative clinical evidence that this new form of

patient care is both safe and effective. Our interest in testing the primary-care performance of nurse practitioners was stimulated by three distinctive features of the medical situation in Ontario: the delivery of primary health care is still oriented toward family physicians, who constitute 48 per cent of all registered physicians in the Province; the total number of family physicians is adequate (with an average ratio of 1:1723 per total population), but they are unevenly distributed so that many rural and small-town family physicians are overburdened¹; and a surplus of well trained,

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experienced nurses has existed in the Province for several years.^{2,3}

An opportunity to perform the desired test was presented in 1970, when two family physicians in Burlington, a middle-class suburban town of 85,000 just east of Hamilton, approached the Faculty of Medicine of McMaster University for possible help in introducing this innovation into their practice. For at least two years, their practice had been "saturated" — accepting no new patients or families because of inability to manage an increased case load. The physicians believed that their office nurses, with appropriate additional training, could assume a substantial portion of the responsibilities for primary care.

With this opportunity and with the offered co-operation of these and other participants, a collaborative group was formed, and two complementary randomized trials were designed. In one of these trials, reported elsewhere,^{4,5} the major emphasis was on the way in which physicians and nurses were affected by the new form of practice. In the second trial, which is reported here, the principal concerns were with the effects on patients and on the practice itself.

PARTICIPATING PERSONNEL AND BACKGROUND

The two family practices under study had previously had no affiliation with a university or other institution. Patients in each practice were free to seek any desired source of primary care, and the costs of care, regardless of source, were completely covered by universal health insurance in Ontario.

One of the family physicians had received his medical degree in 1953 from the University of Durham and had practiced in Burlington for nine years; the other physician had graduated from McGill University in 1954 and had been practicing in Burlington for 14 years. One nurse had received her R.N. diploma in 1959, and the other nurse in 1948.

Before the study began, the nurses attended a special training program⁶ conducted by the schools of nursing and medicine at McMaster University. The emphasis of this program is on decision making and clinical judgment, rather than on procedural skills. The graduating nurse practitioners are qualified to become not physicians' assistants, but *co-practitioners*, sharing the family physician's responsibility for continuing care of patients. The nurse practitioner learns to evaluate each patient's presenting problems, and to choose from three possible courses of action: providing specific treatment; providing reassurance alone, without specific treatment; or referring the patient to the associated family physician, to another clinician or to an appropriate service agency.

METHODS

The research contained at least three major methodologic challenges: the development of appropriate technics for assessing the outcome as direct effects on the patients' state of health; the development of quantitative methods for evaluating the process of medical care and the dynamics of an experimental practice; and the complex administrative logistics of preparing the patients, training interviewers and other data gatherers, maintaining the protocol and co-ordinating data reduction and analysis.

In this paper, we report the general design, logistics, and data of the trial, together with a summary of the results obtained for patients' health status and quality of care.

The Investigated Patients

Because many clinical problems in primary care involve an entire family, families were chosen as the unit for randomization. A "family," which was defined as a person or group sharing a common pro-

vincial health-insurance number, typically encompasses a breadwinner, the spouse, and the dependent children. From the business records or clinical records of all families using the two practices, 1801 families, representing approximately 4850 people, were enumerated.

To be eligible for the trial, a family had to be established as having an ongoing medical relation with the practices. This relation was demonstrated if one of the family members had either made contact with one of the practices in the prior 18-month period or (during later interviews) identified the doctor as the family physician. The eligible people comprised 1598 families, containing 4325 members.

Randomization

Because a case load half that of a family physician's was considered manageable for a nurse practitioner, the eligible families were stratified by practice of origin, and randomly allocated in a ratio of 2:1. They formed a randomized conventional group, assigned to continuing primary clinical services from a family physician and a conventional nurse, and a randomized nurse-practitioner group, whose first-contact primary clinical services were to be provided by a nurse practitioner. The resulting conventional group contained 1058 families (2796 members) equally divided between the two doctors, and the nurse-practitioner group comprised 540 families (1529 members), equally divided between the two nurse practitioners.

After these assignments were completed, adult patients were sent a letter explaining their clinical allocation and the plans of the study. For subsequent medical care, after July 1, 1971, patients in the nurse-practitioner group were asked to make appointments with the named nurse, instead of with their customary doctor. All the families were given the opportunity to refuse their assignment and opt out of the trial.

Figure 1 shows the timing of these procedures and of subsequent events in the performance of the study.

Selection of Patients for Surveys before and at the End of the Experimental Period

After the letters were distributed, a household survey was performed in a sample of the enumerated families, the *interview cohort*. This cohort received interviews to acquire the data needed for "paired comparisons" of change in health status and medical utilization. The patients for the interview cohort were chosen randomly as a single member from eligible families participating in the trial and living within 32 km of the doctor's office. To ensure sufficient numbers of children in the surveys, one third of the families were randomly designated as "child priority." The member for the interview cohort was then randomly chosen from any children contained in these families or otherwise, from the adults.

The resulting cohort that was successfully interviewed in both years included 817 patients, with 296 in the experimental group and 521 in the conventional control group. The refusal rates in the surveys were 11 per cent in 1971 and 5 per cent in 1972.

Data Obtained before the Experimental Period

Measurements on patients. Trained household interviewers administered pretested standardized questionnaires* to the interview cohort to obtain demographic information, information on prior use of clinical services and data satisfaction with health care. Special questionnaire instruments, described elsewhere, were used for assessing health status in physical function.

Clinician activities. Time-and-motion studies of the physicians and conventional nurses were used to indicate the mixture of clinical and nonclinical activities in a representative week of family practice.

Activities of the practice. A "day-sheet journal" was maintained for all clinical activities in the practices. For each visit or encounter with any medical or nursing practitioner, a separate entry was made in

*For 228 pages of questionnaire instruments used in this project order NAPS Document 02178 from National Auxiliary Publications Service, c/o Microfiche Publications, 305 E. 46th St., New York, N.Y. 10017; remitting \$1.50 for microfiche-copy reproduction or \$34.70 for photocopies. Checks or money orders should be made payable to Microfiche Publications.

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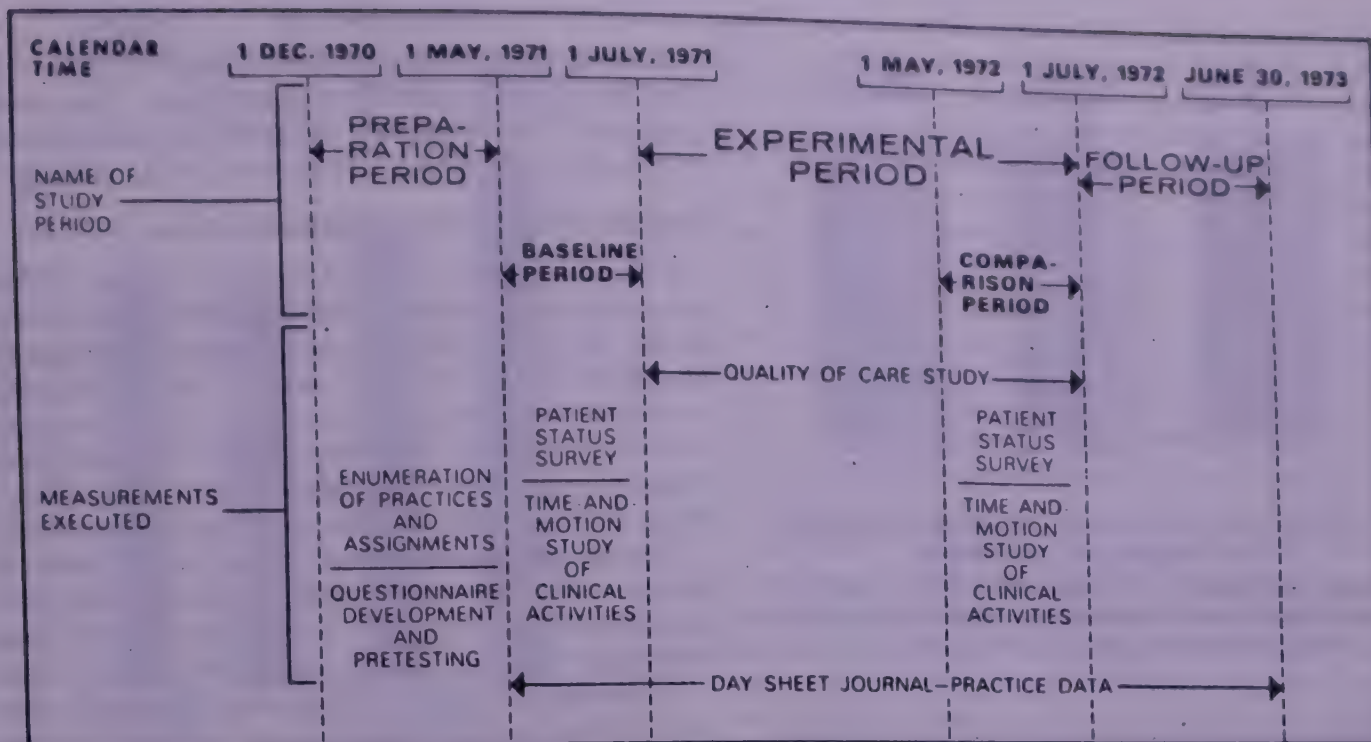


Figure 1. Schedule of Time and Events during Implementation of the Trial.

the journal, and included the following information: the patient's identification number; the date; the type of service; whether the patient was new to the practice; the presenting complaint (or complaints) or problems; diagnosis (or diagnoses); procedures (if any); the principal professional person who provided service at the particular visit; whether the doctor was involved in the visit or whether the nurse practitioner had provided the service alone without consultation; whether the patient was referred outside the practice; whether a prescription had been given to the patient; and the dollar value of service according to the provincial medical association's schedule of fees.*

In the eight-week base-line period, there were 2991 encounters for the groups who became the conventional and nurse-practitioner combined trial practice.

Data Obtained during the Experimental Period

Measurements on patients: In addition to the cited data on health status, "dropouts" were identified, and all deaths were recorded.

Clinician activities. The quality of care in "clinical judgment" used by the co-practitioners was assessed with two quantitative methods. One of these was based on identifying and assessing the manner in which the practitioners managed a series of 10 indicator conditions. As suggested in Kessner's concept of "tracers,"¹² an indicator condition is a distinct clinical entity (such as a disease, symptom, state or injury) occurring frequently in primary care, with an outcome that can be affected favorably or adversely by the choice of treatment. The second method for assessing the quality of medical care was to evaluate the manner in which 13 common drugs were prescribed. Explicit criteria for adequacy in the management of indicator conditions and prescription of drugs were established before the trial by a peer group of nonuniversity family physicians practicing in the same area. The selected conditions and drugs were not known to the Burlington co-practitioners during the trial. These approaches received a preliminary report, with details presented elsewhere.¹³

Practice activities. All clinical activities were monitored throughout the entire experimental period and recorded in the day-sheet journal.

*A service ordinarily given by a physician, but now given by an unsupervised nurse practitioner, was rated at the same dollar value as a doctor's service for purposes of financial analysis, but could not be reimbursed by governmental health insurance.

nal. During the experimental year, data were obtained for 21,085 encounters.

Data Obtained at the End of the Experimental Period

Measurements on patients. The household surveys of health status were repeated, with added questions on social and emotional function.

Clinician activities. The previous studies of clinical activities were repeated during the eight-week comparison period, one year after base line. Quality-of-care measurements were continued to the end of the trial.

Practice activities. The day-sheet journal surveillance was continued for a year after the trial to ascertain longer-term effects of this method of practice on profitability and cost effectiveness.

RESULTS

Base-line Survey and Encounter Data

Measurements on patients (Fig. 2). As determined in the 1971 household survey, the patients in the conventional and nurse-practitioner groups had highly similar values for physical function, ability to carry out usual daily activities and freedom from bed disability. The base-line health status of the two groups of patients showed only minor differences that were not statistically significant (at an α level of 0.05).

Clinician activities. Physicians had been involved in 86 per cent of all visits to the practices, and the conventional nurses alone had dealt with the remaining 14 per cent of encounters.

Results during the Experimental Period

Of the 1598 families eligible for the trial, only seven families (two from the conventional group and five from the nurse-practitioner group) refused their assignments. Two families in the conventional group preferred care by nurse practitioners; two families in the

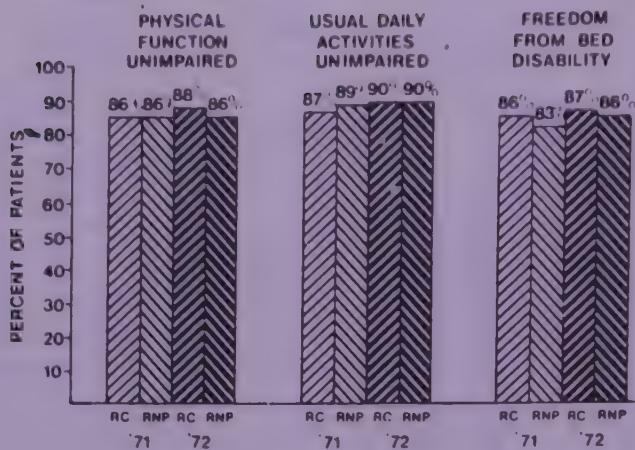


Figure 2. Physical Status of Patients in Surveys during Base-line ('71) and Comparison ('72) Periods.

These results are based on 521 subjects in the conventional (RC) group and 296 in the nurse-practitioner (RNP) group who were assessed in both 1971 and 1972.

nurse-practitioner group opposed the new concept, and three others had had a member under care by a doctor for a long-term problem.

Measurements on patients. During the year 0.9 per cent of families in the conventional and 0.7 per cent in the nurse-practitioner group left the practice because of dissatisfaction.

Clinical activities (Fig. 3). In 392 episodes of care for the 10 indicator conditions, the management was rated as adequate for 66 per cent of episodes in the conventional and for 69 per cent in the nurse-practitioner group. In 510 prescriptions similarly analyzed, an adequate rating was given to 75 per cent in the conventional group, and to 71 per cent in the nurse-practitioner group.*

Practice activities. The doctors in the conventional group continued to be involved in about 86 per cent of all patient visits throughout the trial. For visits of patients in the nurse-practitioner group, the doctors were involved in 45 per cent of visits during the first eight weeks. This proportion fell to 28 per cent by the 20th week, and rose from the 21st to the 44th week, when many new families were being seen for the first time. Starting with the final eight weeks of the trial the proportion of patient nurse-practitioner visits involving the doctor stabilized at 33 per cent. Subsequent follow-up study confirms that nurse practitioners handle two thirds of episodes without consulting a physician.

As noted from our enumerations and household interviews before the trial, the two original practices had provided care for an active roster of 1598 families who had an ongoing relation to the practitioners. Within eight weeks after the new form of practice was introduced, the physicians found that the demands on their

own services had been reduced enough to allow new families to be accepted in the previously "saturated" practices. After one year, the practices had grown to 1952 active families, a net increase of 22 per cent.

Results at the End of the Experimental Period

Clinical outcomes. As shown in Figure 2, the levels of physical status remained closely similar in the patients in the two groups. In measurements performed at the end of the trial in the 1972 survey, the index of emotional function was 58.3 per cent in 521 patients in the conventional and 57.9 per cent in 296 in the nurse-practitioner group. Corresponding values for the index of social function were 83.2 per cent and 83.9 per cent.^{9a}

During the experimental period, there were 22 deaths — 18 in the conventional group and four in the nurse-practitioner group. The difference in crude death rates was not clinically or statistically significant.

In the follow-up survey, 97 per cent of patients in the conventional and 96 per cent in the nurse-practitioner group were found to be satisfied with health services received during the experimental period.

Clinician activities. Figure 4 shows the financial performance of the practices, as compared with the base-line-period level of 100 per cent. The drop of 5 per cent in actual gross practice revenue is explained by the absence of billing for clinical services provided by nurse practitioners. If reimbursement for these services had been permissible, the increased volume of services with a 22 per cent increase in number of families under care would have produced a 9 per cent rise in income. According to the dollar-weighting procedure for fees, services rendered by each nurse practitioner during the trial year were worth approximately \$16,000, of which almost 50 per cent was for unsupervised service.

Together with other financial studies, these data indicate that the economic advantage that society attain-

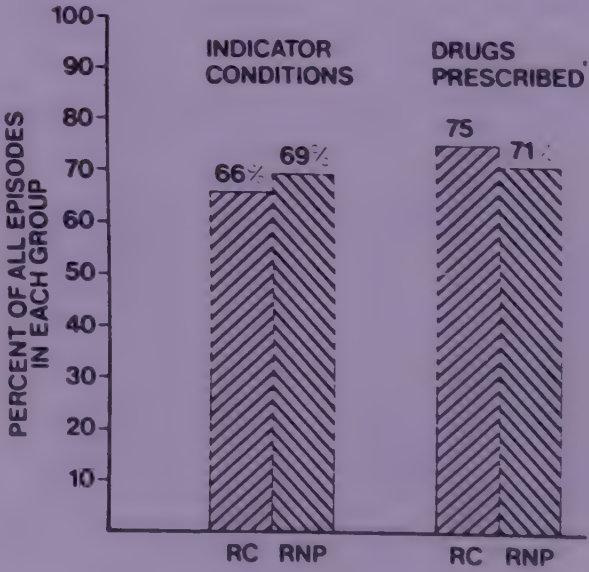


Figure 3. Percentage of Episodes of Care Rated as Adequate. The denominators for these percentages were a total of 392 episodes for indicator conditions — 225 in the conventional (RC) and 167 in the nurse-practitioner (RNP) group — and 510 episodes for drugs (284 in the RC and 226 in the RNP group).

*The differences are not statistically significant at an α level of 0.05. Since demonstration of "no difference" or "no deterioration" is of greater concern in an experiment where we have compared a new form of practice with a standard practice, we also calculated β levels. Given the results, the probabilities of real deterioration of at least 5 per cent in physical function went from 0.02 to 0.01. The probabilities of real deterioration of at least 10 per cent were 0.004 for indicator conditions and 0.08 for drugs.

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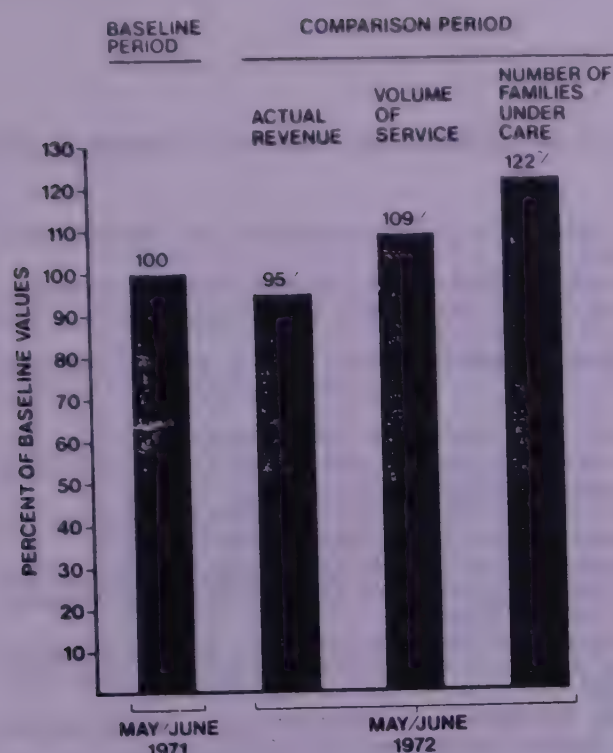


Figure 4. Performance of Practices.

The activities during the base-line period were given a value of 100 per cent for each of the three categories of performance assessed.

from the primary-care nurse practitioner is accompanied, under current Ontario regulations that prohibit billing for unsupervised nurse-practitioner services, by the physician's loss in net income of nearly \$12,000 per year.

Practice activities (follow-up observations). One year after the experimental period had ended, the practitioners reported that they were at a new plateau of "saturation." As of June 30, 1973, 2256 registered families were under ongoing care, a 41 per cent increase from the 1598 families two years earlier.

DISCUSSION

In recent years, a few health-care trials, some with an element of randomization, have been reported.¹⁰⁻¹⁶ The current research adds further evidence that innovations in health care can be assessed with randomized controlled trials.

Neither the concept of the nurse practitioner nor the evaluation of this new concept is new. "Outpost nurses" have established an enviable record of clinical accomplishment in isolated areas in the Canadian North and Maritime provinces.¹⁷ In the United States, Silver and his colleagues^{18,19} pioneered many current concepts of the nurse practitioner's role in pediatrics. Yankauer et al.^{20,21} dealt with other issues of education and the efficient deployment of nurses in pediatric ambulatory settings. Other investigators^{22,23} have described the use of nurse practitioners in adult primary care.

Introduction of the nurse practitioner has often been accompanied by evaluative research, including descriptive studies,^{18,24} surveys^{25,26} and assessment of proc-

ess.^{23,27} Lewis and his colleagues²⁸ made a major contribution to the methods of assessing the effect of nurse practitioners by executing a randomized controlled study conducted in a hospital outpatient setting. Charney²⁹ later performed a similarly controlled trial of the nurse's work in well-child care, and Schlesinger et al.³⁰ used a matched design to test registered nurses in prenatal care.

The work reported here differs from earlier randomized controlled investigations of nurse practitioners, because of the following characteristics: to allow detection of small differences in the variables of interest, our study contained much larger numbers of patients than had previously been admitted to such trials; the role of "experimental subject," assumed by the collaborating physicians and nurses, was almost entirely divorced from the specially trained interviewers, abstractors and observers who acted as "data gatherers"; all the data, including base-line data, were gathered purposefully and prospectively; both traditional and new health-care measurements were incorporated into an experiment patterned after a clinical trial, with the attention directed primarily at changes in health status; the study was carried out in previously saturated practices that were non-university and non-institutional; and, finally, a unique characteristic of the setting was that patients, if dissatisfied, had complete freedom to seek care from another source. Not only were several family physicians in the community accepting new families, but Canadian universal insurance covers costs completely regardless of the chosen source of care.

The results demonstrate that a nurse practitioner can provide first-contact primary clinical care as safely and effectively, with as much satisfaction to patients, as a family physician. The successful ability of the nurse practitioners to function alone in 67 per cent of all patient visits and without demonstrable detriment to the patients has particularly important implications in planning of health-care delivery for regions where family physicians are in short supply.

The increased number of patients who could be added to the previously saturated practices is probably due mainly to the case load carried by the nurse practitioners, but cannot be attributed to their activities alone. The physicians involved in this trial believe that their own work became more efficient since they were forced to develop the rigor and clarity of thought needed to communicate with their co-practitioners.

The decreased gross revenue of the practices is attributable to current regulations that do not permit the governmental health-insurance plan to pay for services rendered by an unsupervised nurse. Since nurse practitioners can provide a major increase in total quantity of clinical service, without a reduction in quality, a suitable adjustment of these financial regulations would make the innovation more attractive to physicians, while allowing society to obtain the additional benefits in care at a net cost that is still less than that of conventional approaches. Several medical practitioners and officials of the provincial health-insurance plan

are now collaborating in an effort to develop appropriate new formulas for these financial arrangements.

We are indebted to Dr. John R. Evans, formerly dean of the Faculty of Medicine of McMaster University (now president of the University of Toronto), for encouragement and support during the preliminary phase of this study (his leadership made possible the environment and the resources required for large-scale health-care trials in the Hamilton region) and to Dr. Alvan R. Feinstein, of Yale University, for counsel and critical review during preparation of the manuscript.

REFERENCES

1. Spaulding WB, Spitzer WO: Implications of medical manpower trends in Ontario 1961-1971. *Ont Med Rev* 39:527-533, 1972
2. Ontario Ministry of Health, Research and Planning Branch: *Mobility, Service and Attitudes of Active and Inactive Nurses*. Toronto, Ontario Ministry of Health, 1968, p 13
3. Canadian Nurses' Association. Report of a Preliminary Survey to Explore the Nursing Employment Situation in Canada in Terms of the Number of 1971 Graduates of Canadian Schools of Nursing Registered/Licensed for the First Time in 1971 Who Were Able or Unable to Obtain Permanent Employment in Nursing as of September 30, 1971. Ottawa, Canadian Nurses' Association, 1972, p 18
4. Spitzer WO, Kergin DJ, Yoshida MA, et al: Nurse practitioners in primary care. III. The Southern Ontario randomized trial. *Can Med Assoc J* 108:1006-1016, 1973
5. Spitzer WO, Russell WAM, Hackett BC: Financial consequences of employing a nurse practitioner. *Ont Med Rev* 40:96-100, 1973
6. Spitzer WO, Kergin DJ: Nurse practitioners in primary care. I. The McMaster University educational program. *Can Med Assoc J* 108:991-995, 1973
7. Kessner DM, Kalk CE, Singer J: Assessing health quality — the case for tracers. *N Engl J Med* 288:189-194, 1973
8. Kessner DM, Kalk CE: *A Strategy for Evaluating Health Services*. Washington, DC, Institute of Medicine, National Academy of Sciences, 1973, p 219
9. Sibley JC, Rudnick KV, Bell JD, et al: A quantitative approach to quality of primary care. *Clin Research* 21:726, 1973
- 9a. Sackett DL, Spitzer WC, Gent M, et al: The Burlington randomized trial of the nurse practitioner: health outcomes outpatients. *Ann Intern Med* (in press)
10. Katz S, Vignos PJ Jr, Moskowitz RW, et al: Comprehensive outpatient care in rheumatoid arthritis: a controlled study. *JAMA* 206:1249-1254, 1968
11. McKee WJE: A controlled study of the effects of tonsillectomy adenoidectomy in children. *Br J Prev Soc Med* 17:49-69, 1963
12. Dawson JJY, Devadatta S, Fox W, et al: A 5-year study of patients with pulmonary tuberculosis in a concurrent comparison of home and sanatorium treatment for one year with isoniazid plus PAS. *Bull WHO* 34:533-551, 1966
13. Ford PA, Seacat MS, Silver GA: The relative roles of the public health nurse and the physician in prenatal and infant supervision. *Am J Public Health* 56:1097-1103, 1966
14. Mather HG, Pearson NG, Read KLQ, et al: Acute myocardial infarction: home and hospital treatment. *Br Med J* 3:334-338, 1971
15. Harpur JE, Kellett RJ, Conner WT, et al: Controlled trial of early mobilisation and discharge from hospital in uncomplicated myocardial infarction. *Lancet* 2:1331-1334, 1971
16. Hutter AM Jr, Sidel VW, Shine KI, et al: Early hospital discharge after myocardial infarction. *N Engl J Med* 288:1141-1144, 1973
17. Robertson HR: *Health Care in Canada: A commentary* (Science Council of Canada Background Study Series No 29). Ottawa, Information Canada, 1973, pp 99-100
18. Silver HK, Ford LC, Stearly SG: A program to increase health care for children: the pediatric nurse practitioner program. *Pediatrics* 39:756-760, 1967
19. Silver HK: The school nurse practitioner program: a new and expanded role for the school nurse. *JAMA* 216:1332-1334, 1971
20. Yankauer A, Connelly JP, Andrews P, et al: The practice of nursing in pediatric offices — challenge and opportunity. *N Engl J Med* 282:843-847, 1970
21. Andrews P, Yankauer A, Connelly JP: Changing the patterns of ambulatory pediatric caretaking: an action-oriented training program for nurses. *Am J Public Health* 60:870-879, 1970
22. Brunetto E, Birk P: The primary care nurse — the generalist in a structured health care team. *Am J Public Health* 62:785-794, 1972
23. Lewis CE, Resnik BA: Nurse clinics and progressive ambulatory patient care. *N Engl J Med* 277:1236-1241, 1967
24. Ford LC, Silver HK: The expanded role of the nurse in child care. *Nurs Outlook* 15:43-45, 1967
25. Day LR, Egli R, Silver HK: Acceptance of pediatric nurse practitioners: parent's opinion of combined care by a pediatrician and a pediatric nurse practitioner in a private practice. *Am J Dis Child* 119:204-208, 1970
26. Chenoy NC, Spitzer WO, Anderson GD: Nurse practitioners in primary care. II. Prior attitudes of a rural population. *Can Med Assoc J* 108:998-1002, 1973
27. Lees REM: Physician time-saving by employment of expanded-role nurses in family practice. *Can Med Assoc J* 108:871-875, 1973
28. Lewis CE, Resnick BA, Schmidt G, et al: Activities, events, and outcomes in ambulatory patient care. *N Engl J Med* 280:645-649, 1969
29. Charney E, Kitzman H: The child-health nurse (pediatric nurse practitioner) in private practice: a controlled study. *N Engl J Med* 285:1355-1358, 1971
30. Schlesinger ER, Lowery WD, Glaser DB, et al: A controlled test of the use of registered nurses for prenatal care. *Health Serv Rep* 88:400-404, 1973

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An evaluation of a rehabilitation workshop

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Summary

Staff awareness of the steps involved in rehabilitation was assessed before and after a multidisciplinary workshop concerned with the aims, methods and principles of rehabilitation in psychiatry. Results were compared with similar assessments derived from a matched control group which was not exposed to any educational programme. The data suggest severe limitations in staff performance on the rehabilitation problem solving task which was used. Performance was not improved by the workshop, and the limitations of staff opinion as measures of the educational value of the workshop were clearly demonstrated. These results are consistent with other findings, and demonstrate the need to evaluate educational programmes provided in the Health Services.

Key words: *REHABILITATION; PSYCHIATRY/*educ;
EVALUATION STUDIES; INSERVICE TRAINING; WALES

Introduction

The aim of this investigation was to evaluate a multidisciplinary workshop which was provided to acquaint staff with the principles, methods and problems of rehabilitation in a psychiatric setting.

The workshop had been organized on one previous occasion, and involved considerable expenditure of time, effort and money. In view of the effort and resources involved—and the intention to repeat the

workshop at regular intervals—it was decided to attempt an objective evaluation of its contribution to staff expertise and performance. An objective evaluation also seemed important in view of previous demonstrations that workshops, and in-service courses generally, cannot be assumed to produce changes in staff behaviour which justify the effort and cost (Klaber, 1969; Quilitch, 1975).

The investigation undertaken was also concerned with different measures of outcome. The most commonly used index of the value of inservice courses is staff opinion. Quilitch's (1975) results indicated, however, that staff satisfaction is not an accurate guide to the success of a workshop in promoting behavioural change within an institution. It was therefore decided to compare staff ratings of the success of the present workshop with other measures of change, and to establish whether there was any relationship between satisfaction and changes in behaviour.

The workshop

This was organized over a period of 1½ days, and was divided into three sessions, each lasting for approximately three hours. The first was concerned with assessment and goal setting; the second with treatment and management, and the third with the aftercare of the patient in the community. The workshop involved a combination of talks, demonstrations, small and large group discussions. The teachers included two psychiatrists, two psychologists, a social worker, an occupational therapist and an industrial manager. Chairpersons and reporters for the discussions were elected from amongst the multidisciplinary group of twenty

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individuals (doctors, nurses, social workers, occupational therapists, industrial supervisors, psychologists) who attended the workshop. The aims, methods and problems of rehabilitation in psychiatry were stressed throughout the workshop.

Assessments, design and subjects

Assessments

The following assessment was used as a dependent variable. Each individual was shown the following account of a hypothetical case.

'The patient is a 26-year-old male who has been admitted because of his parents' complaints of aggressive outbursts at home. He has always lived with his parents (who are in their late 50's) but their tolerance of him has been increasingly weakened by his failure to hold a job for more than a few days, his rudeness to them and his apparent loss of interest in life. Though he has been abusive to his parents over about 6 months, he has never been physically violent.

Further assessment indicates that he was employed as an apprentice engineer until the age of 20 but since this time has had numerous jobs (mostly unskilled) and long periods of unemployment. He has also gradually lost contact with his friends.

On admission, he was presentable in appearance and deferential in manner. Though he always replies when addressed by others, he is otherwise solitary and withdrawn. His main complaints have been about feelings of fatigue and irritability, and also his failure to keep jobs. He is contented to sit on the ward and read, and is not interested in any ward activities'.

The problem posed for each staff member was as follows:

'If you were responsible for the care and rehabilitation of this person, what steps would you take to help him? In giving your answer, consider a long-term programme of rehabilitation—do not limit yourself to immediate steps or short-term treatment'.

The response was tape recorded and subsequently transcribed for rating by assessors.

The adequacy of each response was rated by using a standard rating system. The system is based on the assumption that a rehabilitation programme

involves five basic and necessary steps, (a) preliminary assessment, (b) formulation of provisional goals for the patient, (c) treatment and management (medical, social and psychological), (d) monitoring of progress and change and (e) aftercare (in the community, if appropriate). Each of these steps is represented in the rating system, and is allocated equal weight. The rating system is available on request to the last author.

Staff response was assessed via two sets of ratings. First, an overall rating of adequacy on a 15 point scale. Second, five separate ratings (each on a 3 point scale) involving each of the five major steps of a rehabilitation programme. On both sets of scores, a poor or inadequate response was indicated by a low numerical score.

The same hypothetical case was used for initial and follow-up assessments. Though repetition introduced the possibility of practice effects at follow-up, such effects could be estimated by repeated ratings derived from a control group who did not attend the workshop.

Staff were also required to complete the rating scales provided in the appendix. These were intended to measure various aspects of satisfaction with the workshop, and were administered at the end of the last session.

Design

Staff who attended the workshop were assessed beforehand, and again after a period of approximately 2 months. The workshop was held within 2 weeks of the first assessment.

In addition, half of the staff attending the workshop were assessed within 10 days of the workshop's termination, and again at the 2-month follow-up. This was to assess whether an examination of their performance soon after the teaching sessions would produce an improvement in their response to the problem case. If this had occurred, their response to the hypothetical case would be expected to be more adequate at the final assessment.

A control group of staff, matched with the experimental group for sex, professional group and age (within 5 years) were also assessed on two occasions with an intervening interval of approximately 2 months. They did not attend the workshop.

Subjects

From a total of twenty staff who attended the

workshop, complete data were available for fifteen. Eight of these were assessed on three occasions, and the remaining seven on two occasions. The control group consisted of ten staff.

In the experimental group, there were seven nurses, four doctors, two psychologists, one administrator and one occupational therapy aide; in the control group there were five nurses, two doctors, one psychologist, one administrator and one occupational therapy aide. There were six males and nine females in the experimental group; three males and seven females in the control group.

Results

The following are the questions posed during the investigation and also the data gathered to provide answers:

- (i) *How long was the follow-up period?* The period between the initial and follow-up assessment was on average 8.6 weeks (± 3.5) for the experimental group and 9.2 weeks (± 2.4) for the controls. The difference was not significant (Mann Whitney $U=57$; $n_s=10$ and 15). The 8 experimental subjects assessed soon after the workshop were seen, on average, 2.75 weeks after the initial assessment.
- (ii) *How reliable were the ratings of staff response to the hypothetical problem?* Every response was rated independently by three assessors (clinical psychologists). Estimates of reliability were calculated in two ways.

First, by calculating Spearman rho rank order correlations from the ratings. Analyses were conducted on the 15 point general ratings. Correlations were calculated separately for initial and follow-up assessments, and also for the experimental and control groups. The three correlations (between the three assessors) for the initial ratings within the experimental group were 0.65 ($P < .01$), 0.78 ($P < .01$) and 0.49 (not significant); at follow-up the correlations were 0.86 ($P < .001$), 0.86 ($P < .001$) and 0.82 ($P < .001$). For the control groups the corresponding correlations were 0.81 ($P < .05$), 0.69 ($P < .05$) and 0.64 ($P < .05$) for initial ratings; the correlations were 0.44, 0.38 and 0.61 at follow-up, none of which were significant. With the exception of the final assessments of the control subjects, there is consistent agreement between the assessors.

Second, degree of agreement between assessors

was also calculated by comparing absolute ratings. For this purpose, the ratings on the 15 point scale were divided into three bands (1-5, 6-10 and 11-15). A disagreement was recorded when ratings fell into different bands. Out of a possible forty-five disagreements for the environmental group (fifteen ratings and three judges), there were fourteen disagreements amongst the initial ratings and five at the follow-up. The number of disagreements for the controls, out of a total number possible of thirty (ten ratings, three judges), were two at the initial assessment and five at the follow-up.

Taken together these results suggest that the ratings are reliable and generally consistent. For further analyses one score was derived from each response, this being the average of the three separate (but correlated) ratings.

- (iii) *How adequate were staff responses to the set problem, and were the responses of the experimental group improved by the workshop?* The responses were again analysed in two ways. First, the subject's mean score (from three assessors) on the 15 point general rating. Second, the sum of scores from the five sections in the rating system (range 0-15). The mean scores and standard deviations are provided below:

15 point general ratings:

	Initial	Intermediate ($n=8$)	Final
Experimental	3.44 \pm 1.65	3.36 \pm 1.80	3.26 \pm 2.40
Control	2.59 \pm 1.23	—	2.73 \pm 1.72

Sum of scores (on five major categories):

	Initial	Intermediate ($n=8$)	Final
Experimental	5.32 \pm 2.48	5.0 \pm 2.44	4.4 \pm 2.8
Control	3.52 \pm 1.59	—	4.1 \pm 1.29

The analyses of the 15 point ratings indicated that there were no significant differences either in initial ratings (Mann Whitney $U=52$; $n=15$ and $n=10$) or final scores ($U=52.5$; $n=15$ and $n=10$) between the experimental and control groups. Similarly, intra group comparisons indicate that there were no changes over time in both groups (Wilcoxon matched pairs signed ranks: $t=40.5$, $n=15$; $t=26.5$, $n=10$). A comparison of final scores for the eight

individuals assessed soon after the workshop and the other seven experimental subjects indicated that the score distributions were not significantly different ($U=32.5$).

The analyses of ratings derived from score counts (the total of five categories) indicated a similar lack of significant differences in both intra and inter group comparisons. The one exception was there was a barely significant decrease in scores within the experimental group between the first and final assessment. (Wilcoxon test: $t=23$, $n=15$, $P<0.05$).

Further analyses were conducted on the relationship between initial and final scores, and also the relationship between the 15 point ratings and the sum of scores from the five rating categories. Both general ratings and score counts were consistent over time for the experimental group. The rank order correlations were 0.93 and 0.87. The corresponding correlations for the control group, however, were 0.32 and 0.18. Similarly, the relationship between general ratings and score counts was high and statistically significant for the experimental group ($\text{rhos}=0.94$) for initial scores, 0.96 for follow-up ratings) but not for the control group ($\text{rhos}=0.26$ and 0.29).

- (iv) *How satisfied were the staff who attended the workshop with the teaching which was provided?* The appendix provides data on the number and percentage of staff who considered that the workshop had been well presented and clear, interesting and relevant. Also included are data on their opinions of whether they had learnt anything, whether the workshop would benefit others, and the extent to which the workshop had provided a statement of the 'obvious' or 'common sense'.

Summary and conclusion

The evaluation of the rehabilitation staff workshop has produced a number of interesting, relevant and sometimes surprising findings.

The first is that staff awareness of the major steps involved in rehabilitation—namely assessment, goal setting, treatment, follow-up and aftercare—is extremely limited. All scores of the response to the problem case were low and in that section of the score range which was clearly indicative of an inadequacy of response.

The second finding was that the workshop did not produce any improvement in staff performance.

Scores for the experimental group did not change. Furthermore, an assessment of staff knowledge soon after the workshop did not affect the adequacy of response at the final assessment. Repeated assessment does not therefore produce any effect such as the consolidation of information. This conclusion was further supported by the relative absence of significant practice effects in all groups.

The final conclusion was that staff opinion was not an accurate guide to the effectiveness of the workshop in improving their performance. A majority of the staff believed that the workshop had been well presented, interesting and relevant. Similarly, a majority thought that they had learnt something, and that a repetition of the workshop would benefit others. Yet the other data indicated no change in their performance on the rehabilitation problem. It is possible, of course, that there were changes which were not detected by the present measures. Whilst this possibility cannot be excluded, the present results do suggest that staff opinion is not necessarily a guide to the effectiveness of teaching provisions. Other measures of outcome (e.g. ratings of the importance of rehabilitation) were, in fact, gathered: an inspection of the results, however, suggests that there were no changes, and that further detailed analyses would not be justified.

In his reviews of evaluative studies of psychotherapy, Paul (1967) concludes that because of the importance of a wide range of factors in determining outcome, research should attempt to answer questions such as 'What treatment, by whom, is most effective for this individual with that specific problem, and under which set of circumstances?'. It seems likely that the evaluation of educational and training programmes should be limited in a similar manner. In other words, the conclusions of this investigation are limited to this workshop.

The analysis of results also revealed an interesting difference between the experimental and control groups. Retest reliabilities were lower for the controls (0.32 and 0.18, compared with 0.93 and 0.87 for the experimentals); similarly, the relationship between the 15 point ratings and the sums of scores on the five categories were lower for the controls (0.26 and 0.29 compared with 0.94 and 0.96). These findings cannot be explained in terms of any obvious differences since the two research groups were homogeneous in age, sex and professional background, and the ratings were conducted at approximately the same time. The worst inter-judge reliabilities were

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also derived from the final assessments of the control group. Though there is no obvious explanation, one factor to be considered is the small size of the control group which might have contributed to the unreliability since small absolute differences could have a disproportionally large effect on the final statistics.

Whatever the limitations of the present results, they clearly demonstrate the need to evaluate educational provisions. Cochrane (1972), has demonstrated the need to evaluate treatment facilities within the National Health Service. This study indicates that controlled trials are equally important in relation to education and training. This conclusion is supported by similar results which have been derived from evaluation of other educational programmes. As has been indicated in the introductory section, Quilitch (1975) demonstrated that a workshop in a mental handicap institution failed to change ward behaviour, and also that staff opinion of the workshop was not an accurate guide to its effectiveness. His review lists other examples of limitations in educational programmes.

In conclusion, the present study does not indicate that all workshops or seminars are ineffective. The results clearly cannot be generalized. The results do suggest, however, that more attention needs to be devoted to evaluating educational provisions in the Health Services. The time devoted to this particular evaluation has also been very cost effective in that it has revealed a serious limitation in this particular educational provision, and has prevented a further expenditure of time and effort which would have been involved in repetitions of this workshop.

References

- COCHRANE, A.L. (1972) *Effectiveness and efficiency. Random Reflections on Health Services*. Nuffield Provincial Hospitals Trust, London.
- KLABER, M. (1969) The retarded and institutions for the retarded—a preliminary report. In: *Psychological problems in mental deficiency*, eds. S. Savason and J. Doris. Harper and Row, New York.
- PAUL, G.L. (1967) Strategy of outcome research in psychotherapy. *Journal of Consulting Psychology*, 31, 2, 109.
- QUILITCH, R. (1975) A comparison of three staff management procedures. *Journal of Applied Behaviour Analysis*, 8, 59.

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Appendix

Below is the questionnaire administered to staff who attended the workshop. Data on their ratings are also provided; the total number of ratings is twenty. *Do you feel that, on the whole, the course was well presented? In other words, was it presented in a manner which was clear and easy to understand?*

Extremely clear	1	5%
Very clear	16	80%
Moderately clear	3	15%
Not really clear	0	0%
Not at all clear	0	0%

How interesting was the course?

Extremely interesting	0	0%
Very interesting	10	50%
Moderately interesting	9	45%
Slightly interesting	1	5%
Not at all interesting	0	0%

Do you feel that the course has been relevant to your work with patients?

Extremely relevant	2	10%
Very relevant	10	50%
Moderately relevant	7	35%
Of slight relevance	1	5%
Not at all relevant	0	0%

Have you learnt anything from the course which you could apply in your work?

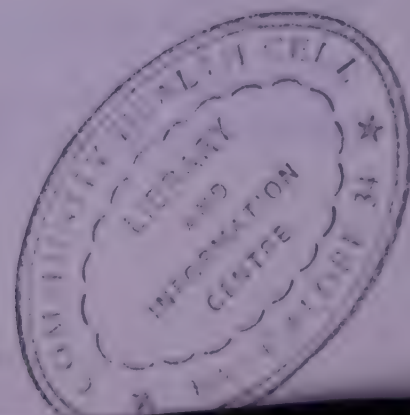
A great deal	4	20%
A fair amount	7	35%
One or two things	7	35%
Not much	2	10%
Nothing at all	0	0%

Do you feel that a course like this might benefit other staff?

Certainly	12	60%
Probably	5	25%
Possibly	3	15%
Probably not	0	0%
Very unlikely	0	0%

Do you feel that the course, or any part of it, provided a statement of the 'obvious' or 'common sense'? Tick below to indicate your judgement.

None of it	0	0%
A very small amount	1	5%
A certain amount	11	55%
A lot of the course	4	20%
Most of the course	4	20%



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evaluation of family planning communications in El Salvador

**by Jane T. Bertrand, Jose David Araya Zelaya,
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Over the past two decades, family planning (FP) has become one of the most widely promoted practices in the history of social development programmes. Before 1960 only a few countries had any type of organized FP programme. By contrast, as of 1977, 35 countries in the developing world had an official policy to reduce population growth, and another 30 gave official support to FP activities for other than demographic reasons. In other words, over 90% of the persons in developing countries now have governments that to some degree support family planning (Nortman and Hofstatter 1978).

One of the primary means of promoting family planning has been information-education-communication (IEC) programmes designed to inform the target population about the availability of family planning and to motivate them to adopt some form of contraception. In general, IEC is considered to be one of the essential elements of an FP programme, along with effective contraceptive methods and an adequate delivery system (Rogers 1973b).

The nature of IEC programmes for family planning has varied greatly from country to country, depending on the degree of support from the government for FP, the availability of resources to produce and diffuse communications, and the creativity of the personnel involved, to mention a few factors. Conventional means for promoting FP include both mass media (e.g. radio, television, posters, pamphlets, newspapers, billboards, movies) and directed interpersonal communications (e.g. individual patient education and counselling, group meetings, home visits, presentations in factories) as well as rather unusual vehicles such as elephants and other moving "exhibits," signs in rickshas, and airdrops, to mention a few (Schramm 1971, Sweeney 1977).

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IEC programmes are expensive, especially when they involve the same media and channels used by commercial advertisers. This had led funding agencies, programme directors, and others to ask what they are getting for their investment. The answer to this seemingly simple question is often difficult to obtain for a series of reasons relating to research design. Some would argue (Haskins 1968) that the only valid means of determining the *effect* of a communications programme is a controlled field experiment (e.g. a before/after study in an experimental and control group). Yet this design has proven impractical for countries with a nationwide IEC programme, thus eliminating the possibility of locating a representative control group. Moreover, if the programme is already in motion (or has been a number of years), one cannot get a valid "before" measurement. Available service statistics or contraceptive sales records may show upward trends, but without the proper design it is impossible to determine to what degree (if any) these increases were brought about by the communications programme.

One such country faced with this dilemma was El Salvador. In 1978 the Asociación Demográfica Salvadoreña (ADS, the Salvadorean Demographic Association) was keenly interested in evaluating its IEC programme, which had by that time been in operation for over a decade. As of 1974 the government adopted an official policy to reduce population growth in this country, and for a number of years El Salvador had one of the most aggressive communication programmes for family planning in Latin America (Morris *et al.* 1979). Considerable funds were invested in IEC programmes over this period; yet there was no tangible evidence as to whether these communications had reached the target population and had had any effect.

Because the IEC programme in El Salvador was nation-wide and had been running for a period of time, a controlled field experiment to determine effect was out of the question. Rather, a different type of evaluation was designed to take advantage of the nation-wide Contraceptive Prevalence Survey (CPS), also to be carried out in 1978 in El Salvador (Asociación Demográfica Salvadoreña 1980). It was recognized that a one-shot survey of the target population would not measure effect *per se* but would, nonetheless, provide information regarding the reach of IEC activities to date and suggest appropriate modifications for future programmes. Specifically, data collected as part of the larger CPS demonstrated:

In terms of past and current activities:

- a) the reach of IEC programmes to date, via the mass media and interpersonal channels;
- b) the source from which the target audience first learned of FP;
- c) the socio-demographic characteristics of those who had had relatively less exposure to FP messages via mass or interpersonal channels; and
- d) the relationship between levels of exposure to FP messages and the current use of contraceptives;

For future IEC efforts:

- e) the most important obstacles to FP, which would be dealt with in the media or through interpersonal channels, and
- f) the most effective scheduling of messages and programmes on the mass media.

One of the chief advantages of collecting data regarding FP communications as part of the Contraceptive Prevalence Survey (known as FESAL-78) was defining a study

population that contained a representative sample of El Salvador's women of reproductive age. Details on the research design follow.

Research design

The sample for the Contraceptive Prevalence Survey represents a subsample of the Encuesta Nacional de Hogares (National Household Survey) for which the sampling frame had been updated earlier that year (1978) by the Ministry of Planning.

For the CPS the country was divided into three strata: metropolitan San Salvador (the capital city), other urban areas, and rural areas. Approximately 1,300 households were selected per strata.

Two-stage probability sampling was used. In the first stage, sectors of approximately 50 households (which constituted the primary sampling unit) were randomly selected. In the second stage clusters of households were selected from these sectors: nine per cluster in the metropolitan and other urban areas, 16 per cluster in the rural areas. A total of 4,076 households was selected at random according to this design, and 2,962 women aged 15 to 49 years were identified as eligible respondents for this survey; completed interviews were obtained from 79% of the total.

The probability of selection was not the same for each strata. The metropolitan and other urban areas were oversampled; in the survey they each represent 32% of the sample; yet these areas actually constitute only 20% and 25% of the population of El Salvador, respectively. Conversely, the rural area was undersampled; it represents 36% of the sample but actually represents 55% of the population of the country.

Also, the probability of selection varied by household. Only one woman of reproductive age (15 to 49 years) per household was interviewed, such that the probability of selection was inversely proportional to the number of women of reproductive age in the household. To adjust for these unequal probabilities of selection (by strata and household), weighting factors have been applied to the data presented below. With the sample drawn in this manner, the variable "current use of contraceptives" has a standard deviation of approximately 3% with a 95% confidence interval, including design effect. For each stratum this variable has a standard deviation of 4-6%.

The questionnaire used to obtain the data was pretested in the field before the survey and modified accordingly. All interviewing was carried out by trained female interviewers between August and December 1978. The data were later coded and computer edited before data analysis began.

Results

The results of this survey fall into two categories: those that reflect past and current IEC efforts (Sections A to D below) and those that provide guidance in the design of future efforts (E and F).

A. THE REACH OF IEC PROGRAMMES TO DATE

In the study reported on here, all respondents were asked whether they had seen or heard a message on family planning via any of six *mass media* (radio, TV, newspapers, movie theatres, posters, or pamphlets) or through any of three interpersonal channels (discussions with health personnel, home visits from an FP

worker, or public meetings on FP). Those who answered "yes" were classified as having been exposed to FP messages via that medium or channel.

One of the key findings was that the overwhelming majority of women in El Salvador—urban or rural—have been exposed to FP messages through either mass or interpersonal channels. As shown in *Table 1*, over 90% of the respondents reported seeing or hearing messages from the mass media. A much smaller percentage had received FP information through interpersonal channels. Overall, 99.6% of the women in metropolitan San Salvador had been reached by IEC efforts; in the rural areas the figure dropped only to 93.3%.

TABLE 1: EXPOSURE TO FAMILY PLANNING (FP) MESSAGES VIA MASS AND INTERPERSONAL CHANNELS, EL SALVADOR, 1978

<i>Percentage of respondents who have seen or heard about FP via:</i>	<i>Total</i>	<i>Metropolitan San Salvador</i>	<i>Other urban</i>	<i>Rural</i>
At least one of the mass media	93.7	99.3	97.4	90.6
At least one of the interpersonal channels	52.0	64.2	56.8	46.5
At least one mass or interpersonal channel	95.5	99.6	98.1	93.3

Of the various media or channels, radio has reached more people with FP messages than any other medium (see *Figures 1 and 2*). In the rural areas 85.0% had heard an FP radio spot, a figure that rose to 90.2% for other urban areas and 94.2% for the metropolitan area. If one takes into consideration *only those women who have access to radio*, the percentage who heard an FP spot on radio increases to 97.5%, 98.1%, and 96.0% in the three areas, respectively.

Slightly over one-third of those exposed reported having heard the spots either "today" or "yesterday"; and over half of those exposed (58.5%, 65.6%, and 60.5% in the three geographic areas, respectively) had heard an FP spot within the past week.

None of the other channels—mass or interpersonal—reached even half (50%) of the total population. After radio, the most far-reaching medium was written pamphlets, which 64.1%, 54.5%, and 39.6% of the respondents from the three geographical areas reported having seen. The majority had seen these FP pamphlets at the governmental health clinics, although respondents from metropolitan San Salvador also mentioned seeing them at the social security clinics, having them at home, or seeing them at ADS clinics. Similar to pamphlets in extent of reach were FP posters (see *Figure 1*), primarily at governmental clinics. In the metropolitan and urban areas, other locations also mentioned with some frequency were the social security clinics, commercial outlets, and the ADS*.

* These data on "location" exemplify the difficulty of "evaluating" the communications programme of a given organization in a country where several institutions provide FP services. In El Salvador, the ADS was the sole producer of IEC materials for family planning from 1968 to 1976, and from 1976 onward has been responsible for supplying the Ministry of Health and the Social Security Institute with materials. As such, these data on "location" indicate the sites at which people have been reached although they do not necessarily reflect the source of the materials.

Television announcements and newspaper advertisements were effective in reaching women in the metropolitan area, but less so in other urban and rural areas. Least effective of the mass media in terms of reach have been advertisements in movie theatres. This reflects the fact that there has been no systematic campaign in movie theatres, that not all areas have movie theatres, and not all of the population would have access to movies because of geographic or financial factors.

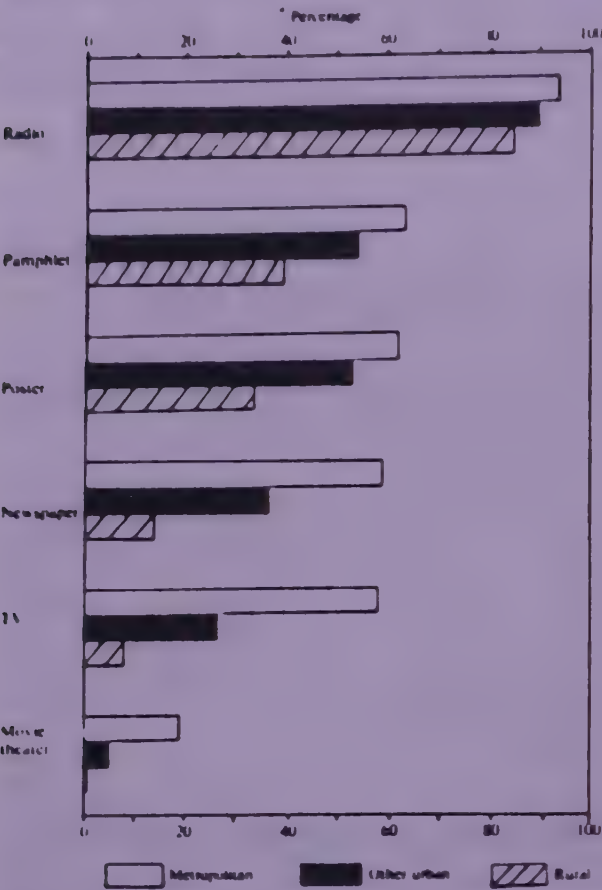
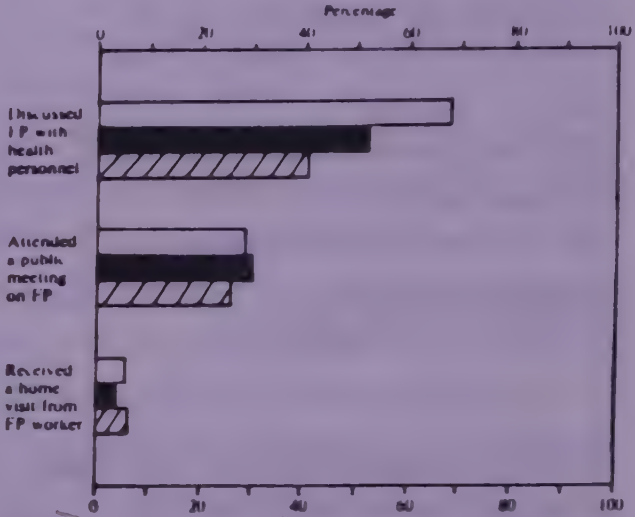


FIGURE 1: THE REACH OF FP MESSAGES VIA THE MASS MEDIA

FIGURE 2: THE REACH OF FP MESSAGES VIA INTERPERSONAL CHANNELS



As for *interpersonal channels*, person-to-person communication with doctors, nurses, and other health personnel was an important information source for the target population. In fact, in rural areas more people reported receiving FP information from this source than from any other channels except radio. And in the metropolitan and urban areas, over half the respondents claimed to have participated in this type of communication.

Approximately one-quarter of the respondents had attended some type of public meeting about family planning. And only a small percentage (6% or less) had received a home visit from an FP worker.

In summary, for the total sample of respondents, the channels of communication for FP messages can be ranked as follows in terms of their reach in El Salvador:

Channel	% reached	Channel	% reached
Radio	87.8	Public meetings	27.4
Pamphlets	47.3	Newspapers	25.9
Discussions with health personnel	46.8	Television	20.9
Posters	43.2	Home visits	5.3
		Movie theatres	4.6

The reach of each mass medium was greater in metropolitan San Salvador than in other urban areas, which was in turn greater than that in rural areas. As for the interpersonal channels, this held true only for discussions with health personnel. Nonetheless, the data in Figures 1 and 2 clearly reflect the fact that less FP information has reached the rural areas than the urban centres.

B. INITIAL SOURCE OF INFORMATION ON FAMILY PLANNING

Communicators are often interested in knowing how people learn about FP for the first time. The study reported on here included a question to obtain this information, and the responses are presented in *Table 2*.

TABLE 2: INITIAL SOURCE OF INFORMATION ON FAMILY PLANNING,
BY AREA OF RESIDENCE

Source	Total	Metropolitan San Salvador	Other urban	Rural
Radio	13.0	2.9	8.5	17.7
Relatives-friends	2.2	0.7	1.1	3.0
Doctor-nurse	1.4	0.2	0.7	2.1
TV	0.1	0.2	0.1	0.1
Printed material, movies	0.1	0.4	0.2	0.0
Social worker	0.0	0.1	0.1	0.0
Two sources	23.7	11.3	22.4	28.3
Three or more sources	56.7	84.0	64.1	45.5
Other	2.7	0.2	2.8	3.3

The vast majority of respondents did not mention just one source but rather multiple sources. In fact, in the metropolitan and urban areas the majority mentioned at least three different sources. Since there are a great number of possible combinations of sources, they have not been listed separately in *Table 2*.

Given that FP campaigns have now been running for more than ten years and that the majority of Salvadorean women have known about family planning for some time, it is possible that many may no longer remember clearly where they first learned of family planning. This would partially explain the multiple answers to this question obtained in this study.

C. SOCIO-DEMOGRAPHIC CHARACTERISTICS THAT RELATE TO EXPOSURE TO FP MESSAGES

It was useful for communicators to be able to identify subgroups within the target population that had received lower-than-average exposure to FP messages. For example, from the tables above it is clear that rural women had had less exposure than their urban counterparts. Our analysis indicates other characteristics of women who have been less likely than others to receive FP messages.

Six socio-demographic variables have been analyzed in relation to amount of exposure to FP messages (see *Table 3*). To identify which variables affect amount of exposure, an exposure score (number of channels through which the respondent had been exposed to FP messages) was computed for each *category* of the variable. Categories with the lowest score represent the women least likely to have been reached by IEC efforts to date.

All six socio-demographic variables were shown to relate to amount of exposure to FP messages. As shown in *Table 3*, exposure was lower among women: who live in rural areas; who have no employment or work at home; who have relatively little education; who are not married or in union; who are under 19 or over 40; who have no children or who have many children.

TABLE 3: SOCIO DEMOGRAPHIC FACTORS AND LEVELS
OF EXPOSURE TO FP MESSAGES

Variable	Categories	Exposure score ¹	Variable	Categories	Exposure score ¹
Place of residence	Metropolitan San Salvador	4.5	Employment	Not employed	2.9
	Other urban	3.5		Works at home	3.5
	Rural	2.5		Works outside	3.8
Education	No formal schooling	2.2	Age	15-19	2.5
	Completed primary 1, 2 or 3	2.9		20-29	3.6
	Completed primary 4, 5 or 6	3.5		30-39	3.3
	Attended secondary or higher	4.5		40-49	2.6
Marital status	Married	3.4	Number of living children	0	3.0
	In union	3.2		1-2	3.5
	Separated or divorced	3.1		3-5	3.4
	Widowed	2.6		6-13	2.6
	Never married	2.6			

¹ This exposure score refers to the number of channels through which the respondent was exposed to FP messages (possible range: 0 to 9; average score for the total sample: 3.09).

This analysis suggests that the *reach* of a communications programme is affected not only by the intensity of the IEC effort but also by the personal situation of members of the target audience. Those women in greatest need—married or in union at the peak of their reproductive year—undoubtedly had higher levels of exposure from seeking out FP information. In addition, exposure was higher for those who had greater contact with the outside world, either through schooling or employment outside the home. Finally, the fact that the lowest levels of exposure were found in rural areas reflects not only less accessibility to media and to interpersonal FP activities, but also lower levels of education of this population.

D. LEVELS OF EXPOSURES TO FP MESSAGES AND THE USE OF CONTRACEPTIVES

It is the working assumption of most IEC programmes that the more extensive the communication effort, the greater the number of contraceptive users. Unfortunately, a “one-shot” survey cannot be used to prove that greater communication efforts *cause* increased use of contraception. Indeed, some would argue that those using contraceptives would be more attentive to communications about family planning since they relate to their own behaviour, and that they thus would have greater levels of exposure to FP messages.

The results of the contraceptive prevalence survey show that 34.4% of Salvadorean women, married or in union, age 15 to 44 are currently using contraceptives. The percentage of users is higher in metropolitan San Salvador (56.4%) than in other urban areas (41.9%) or in the rural areas (26.2%). The full results of the CPS are published elsewhere (Asociación Demográfica Salvadoreña 1980).

For the purpose of this analysis it is of interest to test the relationship between levels of exposure to FP messages and levels of contraceptive use. To this end the “use of contraceptives” has been defined in terms of the distinct stages defined by Rogers (1973a). In this analysis these stages have been operationally defined as follows (categories are mutually exclusive):

Yet to begin the adoption process: knows no contraceptive methods; is not interested in using contraceptives; has never used contraceptives.

Awareness-knowledge of the innovation: knows at least one method; is not yet interested in using contraceptives; has never used contraceptives.

Persuasion of a favourable attitude: knows at least one method; expresses interest in using contraceptives; has never used contraceptives.

Decision to adopt the innovation: has used a contraceptive method in the past (but is not currently using).

Confirmation of this decision: is currently using a contraceptive method.

Since educational level was shown to have an effect on the level of exposure to FP messages, we statistically controlled for this factor in our analysis in order to clarify the relationship between exposure and contraceptive use (Figure 3).

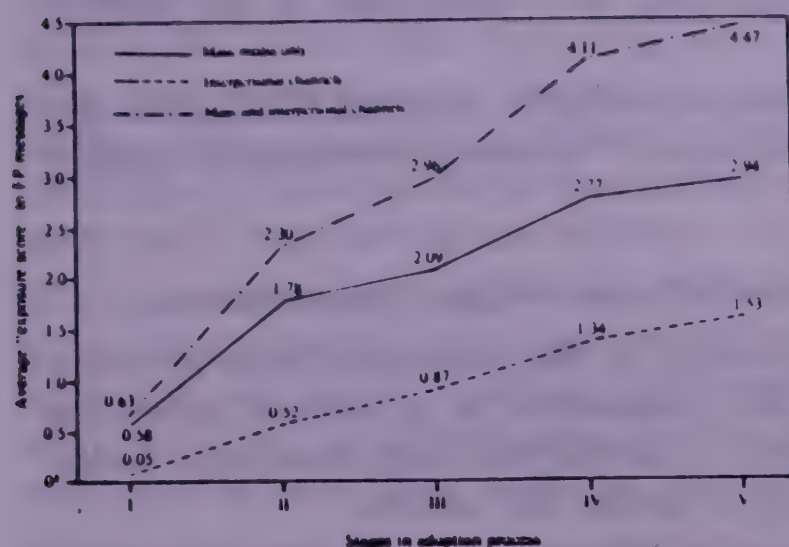


FIGURE 3:
AVERAGE EXPOSURE TO FP
MESSAGES AT EACH STAGE IN
THE ADOPTION PROCESS¹

¹Based on women 15-44 years old, married or in union. In this analysis education was entered as a covariate; as such, the variable education has been controlled for in this figure. The possible range for the exposure scores is 0-6 (mass media), 0-3 (interpersonal channels), and 0-9 (combined channels).

The data from Table 4 and Figure 3 illustrate two aspects of contraceptive usage in El Salvador. First, women in metropolitan San Salvador are much further along in the adoption process than those in other urban and rural areas. Conversely, the percentage who are aware of FP and know at least one contraceptive method but have no interest in using contraceptives is lower in the metropolitan area (18.0%) than in other urban (36.6%) or rural areas (47.0%).

It is of interest that less than 1.0% of the population, even in rural areas, are *not* aware of at least one contraceptive method; this, in part, reflects the aggressiveness of IEC

TABLE 4: STAGES IN THE FP ADOPTION PROCESS
BY AREA OF RESIDENCE ¹

Stages in the adoption process	PERCENTAGE FROM EACH REGION AT THE DIFFERENT STAGES OF ADOPTION			
	Total	Metropolitan	Other urban	Rural
I. Yet to begin the process: does not know even one method	0.6	0.2	0.2	0.9
II. Awareness-knowledge: has heard of at least one method	40.2	18.0	36.6	47.0
III. Favourable attitude: Interested in using an FP method	11.8	7.4	7.9	14.3
IV. Decision to adopt: has tried an FP method	13.0	18.0	13.4	11.7
V. Confirmation of the decision: is currently using an FP method	34.4	56.4	41.9	26.2

¹ Since the data in this table involve contraceptive usage, only women 15-44 years old, married or in union are included in this analysis.

activities in El Salvador. Data from a similar study carried out in the neighbouring country of Guatemala indicate that a much higher percentage (16.6) of Guatemalan women do not know at least one contraceptive method (Pineda *et al.* 1980).

Of particular note is the relationship between exposure to FP messages (as reflected by the average "exposure score" or number of channels via which the respondent has heard of FP) and the adoption of family planning. As shown in Figure 3, those women who have yet to begin the adoption process (have not heard of even one method) have the lowest exposure scores—via mass media or interpersonal channels. These scores are higher for those who are at the knowledge-awareness stage, and they continue to rise monotonically with each stage in the adoption process.

Although it is not possible to interpret this relationship as cause and effect, *these data do provide evidence of a strong association between FP communications and the adoption of a contraceptive method.*

E. OBSTACLES TO FAMILY PLANNING: CONTENT FOR FUTURE PROGRAMMING

In a country where the overwhelming majority of the population know of family planning it is the responsibility of an IEC programme to go beyond promoting awareness. Rather, an effort must be made to identify existing obstacles to family planning, which should then be the focus of further IEC efforts.

To this end, all respondents were asked to rank the importance of a series of possible reasons for not using family planning for couples in general (*Table 5*). Heading the list was the lack of husband-wife communication about family planning (rated by 64.9% of the respondents as "very important"), followed by rumours people have heard about the methods (61.2% considered this to be "very important"). Third most important was the belief that FP goes against God's will (49.2%). And nearly the same number felt that people do not worry enough about the future of their children (48.6%).

Other reasons include the belief that people need to have more children to help them in their old age (41.6%) and that people do not have sufficient knowledge of all contraceptive methods (38.6%). Other items, rated as less important by the respondents, include the following: people want to have more children (36.9); people accept the pregnancies that occur without worrying about it (36.7); people need to have more children to help them with work (economic value of children) (35.2); people prefer male children and keep having children until they have sons (33.7); people worry about what their friends and neighbours would think of them (28.3); and people don't know where to get contraceptive methods (22.7).

The importance assigned to these different factors clearly varies by geographic area. In general, the percentages of respondents who classified a given factor as a "very important reason" for couples not using contraceptives were lowest in the metropolitan area and highest in the rural area, suggesting the greater acceptance of FP in the former.

Within this general pattern it is interesting to note the relative importance given to the different factors. All three groups ranked "lack of husband-wife communication" and "rumours" in first and second place, respectively. Yet with other variables there were notable differences. For example, metropolitan and urban respondents considered the third greatest obstacle to be that "people don't worry enough about the future of their children", whereas rural women gave more importance to religious beliefs, infant mortality, and support in old age.

- x -

Another marked difference involved the economic value of children, seen as an important factor in rural areas but given the least importance of all the possible obstacles by the metropolitan population. Likewise, the urban population was much less concerned than the rural as to what friends or neighbours would think of their using an FP method.

While not all the reasons discussed above can be dealt with directly in a communications campaign, a number of these items could usefully serve as a basis for the content of future IEC efforts.

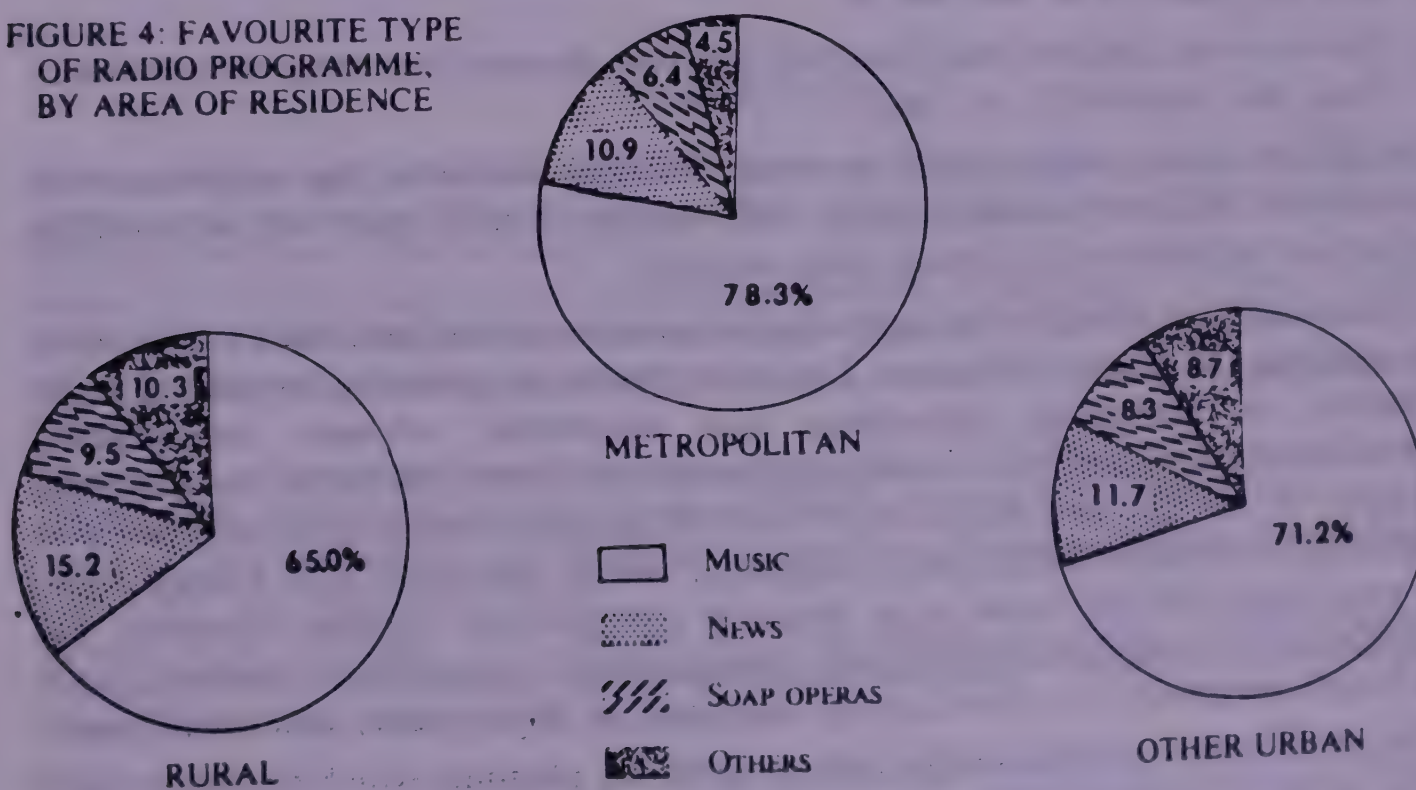
F. EFFECTIVE SCHEDULING FOR MESSAGES IN FUTURE IEC PROGRAMMES

As described above, radio has reached more of the women in El Salvador than any other medium or channel. Indeed, our study shows that 78.9% own radios and another 11.8% can listen to a radio elsewhere. This makes a total of 96.6%, 91.9%, and 88.5% of the women in the metropolitan area, other urban areas, and rural areas, respectively, who have access to radio.

In terms of scheduling programmes or spots on radio, it is important to consider the most popular listening times and favourite programmes of the target population. Our study indicates that more women listen to radio between 8 a.m. and 12 noon than at any other time in all three geographic areas. The second most popular time in all three areas is from 2 p.m. to 6 p.m., followed by 6 p.m. to 10 p.m.

Without question the most popular type of programming is music (mentioned by 78.3%, 71.2%, and 65.0% of the respondents in the three geographic areas, respectively). News rated second (mentioned by 10.9%, 11.7%, and 15.2% of the respondents), followed by the *novelas* or soap operas (6.4%, 8.3%, and 9.5%). Religious, educational or sports programmes were mentioned infrequently (see Figure 4).

FIGURE 4: FAVOURITE TYPE OF RADIO PROGRAMME, BY AREA OF RESIDENCE



Television reaches a much smaller segment of the population than does radio. While 72.1% of the respondents in metropolitan San Salvador reported to have TV or to have access to a set at least once a week, this percentage drops to 40.3 in other urban areas and to a mere 10.7% in rural areas. Thus, it cannot be considered a potentially effective means for reaching the target population outside the metropolitan areas.

If TV programming is used to reach the target population, it should be noted that the peak listening time is between 6 p.m. and 10 p.m. with the period from 12 noon to 2 p.m. a distant second. The decided preference for female viewers in all geographic areas was for the *novelas* or soap operas followed by adventure and comedy shows.

Implications of the findings

Although this survey does not directly measure the impact of ten years of IEC programming on the use of contraceptives in El Salvador, it nonetheless provides useful and thought-provoking data regarding FP communications which are of interest not only to this country but to programme planners in other parts of the world.

Our findings reflect the fact that El Salvador had one of the most aggressive IEC programmes for family planning of any Latin American country during the 1970s. That almost 100% of the women in the capital city and over 90% of rural women have seen or heard FP messages via at least one mass or interpersonal channel attests to the coverage of this programme. Of the various media, radio has been by far the most effective in reaching the women in El Salvador.

However, not all segments of the population have been reached to the same extent (as measured by the number of channels through which the respondent had heard of FP). Exposure has been lower among women:

- who live in rural areas;
- who have no employment or who work at home;
- who have relatively little education;
- who are not married or in union;
- who are under 19 or over 40; or
- who have no children (and thus may perceive no need) or many children (and, thus, may consider it too late).

One of the points highlighted by these findings concerns the importance of establishing effective communication with women 15 to 19 years old, who will be influential in tomorrow's demographic situation.

It is also useful to consider the types of communication that have been used to date for reaching the target population. The mass media are generally considered to be effective in promoting knowledge and awareness, whereas interpersonal communication is important in bringing about attitudinal and behavioural change (Rogers 1973a). Our data reflect the efficacy of the mass media (especially radio) in diffusing information about family planning; indeed, less than 1% of women, even in rural areas, did not know of at least one contraceptive method. However, the percentage of women reached through "programmed" interpersonal channels (such as health personnel in a clinic, group meetings, or home visits) was much lower.

The disparity between knowledge and use of family planning which currently exists is a universal problem. Education interventions are based on the premise that the problem has its roots in specific identifiable causes and that these causes can be corrected by appropriate communication-education programmes (Bogue 1975). In the present study the main obstacles include:

- the lack of husband-wife communication;
- rumours people heard about the methods;

- the belief that FP goes against God's will; and
- the lack of concern over the future of one's children.

While it could be counterproductive to deal with certain themes (such as religious beliefs vis-à-vis family planning) via the mass media, these concerns could be addressed in interpersonal exchanges.

Our survey indicates the potentially most effective times for scheduling programming as well as the preferred types of programming, to allow for effective use of mass media in future IEC programmes. The fact that programmes with music are by far the most popular type among the target population suggests two strategies: (1) to concentrate one's FP spots during musical programmes; or (2) to use more musical introductions, tags, or jingles as part of the FP communication itself.

The results of this survey are useful in several respects. Apart, from its value to the programme directors and communicators, the survey is important from the point of view of communications research involving nationwide programmes. In the past, most communication programmes for social development were carried out without the benefit of follow-up research. In part, this has been the case because of the expense involved in undertaking a nation-wide survey with a probabilistic sample. However, by adding a set of communications questions to the standard items on the contraceptive prevalence survey, it was possible to obtain data from a representative sample of the target population (women of reproductive age) at marginal cost. At least in the area of population and family planning, this represents a useful, practical mechanism for obtaining information on existing communications programmes and providing guidelines for future efforts. It should be equally applicable to other topics for which nation-wide surveys are also carried out.

BIBLIOGRAPHY

- Asociación Demográfica Salvadoreña (1980). *Encuesta Nacional de Fecundidad, Planificación Familiar y Comunicación Masiva de El Salvador (FESAL-78): Primera Parte-Fecundidad y Planificación Familiar*. San Salvador.
- Bogue, D.J. (1975). *Twenty-five Communication Obstacles to the Success of Family Planning Programs*. Chicago: Community and Family Study Center.
- Haskins, J.B. (1968). *How to Evaluate Mass Communications*. New York: Advertising Research Foundation.
- Morris, L., Castañeda Rugamas, R., Mendoza, A.M. & Taylor, S. (1979). Contraceptive Use and Demographic Trends in El Salvador. *Studies in Family Planning* 10:2:43-52.
- Nortman, D. & Hofstatter, E. (1978). *Population and Family Planning Programs*. Ninth Edition. New York: The Population Council.
- Pineda, M.A., Bertrand, J.T., Santiso, R.G., & Morris, L. (1980). Family Planning Communications in Guatemala: Nationwide Survey. Asociación Pro-Bienestar de la Familia, Guatemala. Mimeo (Submitted for publication).
- Rogers, E.M. (1973a). Mass Media and Interpersonal Communication. In Itzhel de Sola Pool, Frederick W. Frey et al. (eds): *Handbook of Communication*. Chicago: Rand McNally College Publishing Co.
- Rogers, E.M. (1973b). *Communication Strategies for Family Planning*. New York: Free Press.
- Schramm, W. (1971). *Communication in Family Planning*. New York: Population Council, *Reports on Population/Family Planning* No. 7:1-43.
- Sweeney, W.O. (1977). Media Communications in Population/Family Planning Programs: a Review. *Population Reports*, Series J, No. 16:289-320.

HISHAM NAZER

Occasional Review

Acute Diarrhoea in the Developing World

by HISHAM NAZER, M.R.C.P. (U.K.), D.T.M. & H.D.C.H.*

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Diarrhoeal disease has long been recognised as the main killer of infants and young children in the developing world.

Gastroenteritis, the name given to most diarrhoeal episodes in childhood in both developed and developing worlds remains a major health hazard in paediatric practice. It is a major cause of morbidity and mortality among preschool children of the developing world. During the first year of life, children in India have an average 5 to 6 episodes of diarrhoea a year (Maiya *et al.* 1977).

Poor socioeconomic conditions, illiteracy, poor sanitation and drainage system and lack of safe water supply are but a few of the factors causing the prevalence of diarrhoea and malnutrition in the developing world. It is estimated that 78% of the rural population in the third world is without clean water supply and 85% is without adequate sewage and other excreta disposal facilities (Agarwal, A. 1979).

The impact of water restriction on health was also studied during a severe drought in Haiti. Diarrhoea rates were seen to be higher for children from homes using less than one can of water per person per day (Thacker *et al.* 1980). Shortage of firewood, as shown in U.K. M.R.C. study in Kenaba, Gambia, has forced the people to cook their food in advance especially in the rainy season. This made the food of infants and young children overgrown with bacteria even after cooking (Barrell and Rowland 1979).

Incidence and Seasonal Variation

Diarrhoea is the most common complaint in children below the age of 5 years during the summer

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months. The incidence varied slightly amongst different reports from various developing countries.

Sunoto *et al.* (1977) gave a figure of 22.8% of total admissions to university hospital in Jakarta, Indonesia. This figure is similar to those from other developing countries such as Malaysia (Abraham and Tan, 1974), India (Naruka *et al.* 1974), Puerto Rico (Ortiz, 1974) and elsewhere. (Hernawan *et al.* 1978). In west Azerbaijan, Iran, primary health care project (1972) revealed a figure of 22.2% for diarrhoeal complaint in children under the age of 5 years during the summer months. The study was analysed further to show that by 1976 the incidence was 14% in summer and 4% in winter of the health centre attendance (Barzgar *et al.* 1980).

The summer peak for diarrhoeal diseases has also been shown in reports from India (Arora *et al.* 1955, Sarin *et al.* (1957), Sood (1963) and Dutta *et al.* (1974) (Datta Banik, 1979) and South African Black Population (Spencer and Coaster, 1969). In Jordan with 20% of admissions to paediatric unit at Jordan university hospital being for diarrhoea reach a figure of 40% in late summer and early autumn (Khuri-Bulos and Hamad, 1980).

The overall incidence of gastroenteritis in developing countries is estimated as 50-70% per 100 population per year. The above mentioned figures from the developing world contrast with those from the developed world in having a winter peak and less incidence of diarrhoeal episodes among hospital attendants; for example 7.5% from England. (Tripp *et al.* 1977).

Sex and Age Incidence

Various studies in the developing world showed higher frequency of males affected with diarrhoeal diseases than females, for example Goa, India 3:2 (Mavinkurve and Ferrao, 1979). Indonesia 1.8:1 (Hernawan *et al.* 1978), Jordan 2.2:1 (Khuri-Bulos and Hamad, 1980). There were similar views in reports from the developed world as that from England 2.4:1 (Weindling *et al.* 1980). Most studies reported a peak age incidence between 6 months and a year.

Table 1
Rates of identification of bacterial and viral pathogens in the developing world

Country	Number of Children	Viral (%) Positively Identified	Bacterial (%)	References
Goa, India	210	not looked for	82.6%	Mavinkurve <i>et al.</i> 1979
Southern India	50	26%	35.2% (<i>E. coli</i>)	Maiya <i>et al.</i> 1977
Indonesia	100	not looked for	66%	Sunoto <i>et al.</i> 1977
Indonesia	35	=	13%	Sunoto <i>et al.</i> 1978
Jordan	191	=	68.7%	Khuri-Bulos & Hamad 1980
Northern Nigeria	21	61%	8%	Dossetor <i>et al.</i> 1979
South Africa	70	4%	10%	
			78%	
			(50% single pathogen)	Robins Browne <i>et al.</i> 1980
			(43% E.P.E.C.)	
=	37	6% by E.M.	81% (Enteropathogens)	Schoub <i>et al.</i> 1977
		49% by R.C.F.T.	41% (Enterotoxigenic)*	
Bangladesh		45%		Taylor <i>et al.</i> 1980
			55% (Enterotoxigenic)*	Nalin <i>et al.</i> 1975
Taiwan	75	56%	16% <i>E. coli</i>	Echeverria <i>et al.</i> 1977

E.P.E.C. = Enteropathogenic *Escherichia coli*. E.M. = Electron Microscopy. R.C.F.T. = Reverse complement fixation test.

* In contrast with figures from the developed countries such as Britain (Gross *et al.* 1976) (Gribben *et al.* 1976) and United States ranging from 73% in Chicago (Gorbach and Khurana 1972) to zero in Boston (Echeverria *et al.* 1975).

Causative Organisms

The rates of isolation of bacterial or viral pathogens varied in different reports from the developing world. This was influenced by the type and time of the study, its location, its objectives and by the status of health and education in that area.

Table (1) elicits clearly the variable ratios of bacterial versus viral organisms in some of the studies performed in the developing world.

Malnutrition

Global improvement of nutrition is essential to break the link between diarrhoea and malnutrition.

Anaemia and malnutrition were present at a high rate in an epidemiological survey of 2493 Preschool children in India. (Datta Banik, 1978). Schoub *et al.* (1977) reported that over half of black South African infants affected with acute summer gastroenteritis showed evidence of malnutrition. Malnutrition increases susceptibility to infection and infestation through lowering antibody production. The recognised associated complications of diarrhoeal disorders and the resultant mortality rate also increase with increasing severity of malnutrition. (Kumar *et al.* 1977).

Breast Feeding

The importance of breast feeding can never be over emphasized especially in the developing world.

Its protective value against some respiratory, gastrointestinal and allergic disorders is well recognised. This is especially so if breast milk alone is given for the first six months of life and more so among the lower socio economic segment of the population.

The World Health Organisation issued a report in 1973 stating that in rural Chile, the infant mortality rate has risen due to the fall in the prevalence of breast feeding (Plank and Milanese, 1973).

Breast fed infants receive an initial bolus of IgA in colostrum in addition to IgG acquired through the placenta. This offers the baby better protection against various gastrointestinal disorders. The supply of antibody to the infant will continue with the continuing supply of breast milk. (Gerrard, 1974). Thus breast milk may provide the basic essential aspects of immunity for the infant with defective host defence mechanism. (France *et al.* 1980).

The Pan American Health Organization study (Puffer *et al.* 1973) has stressed the value of giving the young infants breast milk alone without additional cow's milk to ensure a better protection. The government of Papua New Guinea has made bottles for infants feeding available only on a prescription.

Diarrhoea is more prevalent in infants of lower socio-economic status who are malnourished and artificially fed. Poor hygiene, increased rate of malnutrition and lack of adequate safe water supply predispose to infection. Breast milk will play an

important role in reducing the incidence and mortality rate of infantile gastroenteritis. (Schoub *et al.* 1977). With a decline in breast feeding and indiscrete advertising to encourage bottle feeding, acute gastroenteritis poses a major health hazard.

There is an increased incidence of acute gastroenteritis with dehydration as well as a greater risk of developing cows' milk protein intolerance with enteropathy. (Walker-Smith *et al.* 1978). This can lead to the development of malnutrition from chronic diarrhoea as has been shown by Manuel *et al.* (1981) in their study on Indonesian Infants.

Oral Rehydration Therapy

The use of oral electrolyte solution containing glucose in the management of infantile diarrhoea was suggested by Darrow in 1949. Chatterjee in 1953 made use of such therapy in the treatment of 186 patients with mild cholera. It was later found that sodium transport and glucose transport are coupled in the small intestine so that absorption of water and salt can be accelerated by giving glucose (The Lancet 1975).

Recently Ksiazka *et al.* (1981) performed perfusion studies in rat jejunum to compare the effect of sucrose and glucose on modifying cholera toxin induced intestinal secretion. The study gave further evidence of the usefulness of sucrose instead of glucose in oral rehydration therapy. This observation has practical implications in the developing world. (Nalin *et al.* 1978, Estes and Graham, 1979).

Controlled studies in Indonesia, Pakistan, Puerto Rico and the Philippines have all shown a major reduction in the mortality rate from diarrhoea since the introduction of oral rehydration therapy (Diarrhoea Dialogue 1981). Similar results have been achieved with such therapy in reports from Turkey (Bertan and Egeman, 1979), Iran (Barzgar *et al.* 1980) and Indonesia (Sunoto *et al.* 1978).

The easy availability of antibiotics account for their frequent misuse for treatment of diarrhoeal disease in the developing world. Antibiotics are not necessary even in the very few cases of bacterial gastroenteritis. Sunoto *et al.* (1978), have concluded in their study on treatment of infantile gastroenteritis in Indonesia that the results of the treatment are about the same with or without antibiotics. The use of antibiotics indiscriminately in Paediatrics in the developing world needs further appraisal.

Morbidity and Mortality

Diarrhoeal episodes are associated with a very high mortality rate reaching up to 20% among affected children in the developing world (Sunoto *et al.* 1974), Jordan 5% (Khuri-Bulos and Hamad, 1980), India 5.1-6.5% (Datta Banik). This is

compared with rates from the developed countries like England at 1% (Walker-Smith, 1972).

The aetiology for such high mortality rate is multifactorial. This includes severity of the diseases, inappropriate treatment, status of health and nutrition and ignorance of parents.

Conclusion

It is obvious that most of the gastrointestinal disorders in the developing world require essentially primary health care and very basic nursing management. Home based care for families and their infants at risk has to be encouraged. Oral rehydration therapy has to be utilized more in the management of infantile gastroenteritis. A long term objective must focus on improving water supplies, sanitation, health care facilities and promotion of breast feeding for young infants.

References

- Maiya, P.P., Pereira, S.M., Mathan, M., Bhat, P., Albert, M. J. and Baker, S. J. Aetiology of acute gastroenteritis in infancy and early childhood in Southern India. *Archives of Disease in Childhood*, (1977) 52, 482-485.
- Agarwal, A. A cure for a killer but how to deliver it? *Nature* (1979) 278, 389.
- Thacker, S. B., Music, S. I. and Pollard, R. A. Acute water shortage and health problems in Haiti. *The Lancet*, (1980) 1, 471-474.
- Barrell R. A. and Rowland M.G.M. Infant food as a potential source of diarrhoeal illness in rural West Africa. *Transaction of the Royal Society of Tropical Medicine and Hygiene* (1979) 73 (1), 85-90.
- Sunoto, Titut, S. Pusponegoro, Surachmad Susilo and Sanborn Treatment of acute infantile gastroenteritis, *Paediatrica Indonesia* (1977) 17, 351-360.
- Hernawan, Sunoto, Titut S. Pusponegoro and Suharjono. Treatment of acute infantile gastroenteritis dehydration acidosis with Ringer's lactate and glucose-electrolyte solution. *Paediatrica Indonesia*, (1978) 18, 83-90.
- Barzgar, M.A., Ourshano, S. and Nasser Amini, J. The evaluation of the effectiveness of Oral rehydration in acute diarrhoea of children under three years of age in West Azerbaijan, Iran. *Journal Tropical Pediatrics*. (1980) Vol 26, 217-222.
- Datta Banik, N.D. Epidemiology of gastroenteritis of Pre-School children in slum areas in Delhi with reference to helminthic and parasitic infection. *Indian J. Pediatr.* (1978) 45, 369, 303-309.
- Spencer, I.W.F. and Coster, M.E.E. The epidemiology of gastroenteritis in infancy. *South African Medical Journal* (1969) 43, 1391, 1438, 1446.
- Khuri-Bulos, N.A. and Hammad, H.A.M. Gastroenteritis in Jordanian children, Reappraisal of the usefulness of currently used diagnostic and therapeutic measures in a university hospital. *Jordan Medical Journal* (1980) 14, 1, 43-52.
- Tripp, J.H., Wilmers M.J. and Wharton, B.A. Gastroenteritis: A continuing problem of child health in Britain. *The Lancet*, (1977) 2, 233-236.
- Mavinkurve, S. and Ferrao, V. (1979). Microbiological studies on gastroenteritis in hospitalized children in Goa. *Indian Paediatrics* (1979) 151, 1, 27-31.

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- Weindling, A.M., Walker-Smith, J.A. and Bird, R. Micro-Organisms in outpatient infantile gastroenteritis. *Archives of Disease in Childhood*, (1980) 55, 185-188.
- Sunoto, Herman Pih, Adnan, S., Wiharta and Suharyono. An oral electrolyte solution (Pedialyte) in the treatment of acute infantile gastroenteritis. *Paediatrica Indonesia*, (1978) 18, 199-208.
- Dossetor, J.F.B., Chrystie, I.L. and Totterdell, B.M. Rotavirus gastro-enteritis in Northern Nigeria. *Transaction of the Royal Society of Tropical Medicine and Hygiene*, (1979) 73, 1, 115-117.
- Robins-Browne, R.M., Still, C.S., Miliotis, M.D., M.D., Richardson, N.J., Koornhof, H.J., Freiman, I., Schoub, B.D., Lecatsas, G. and Hartman, E. Summer diarrhoea in African infants and children. *Archives of Disease in Childhood*, (1980) 55, 923-928.
- Schoub, B.D., Greef, A.S., Lecratsas, G., Prozesky, O.W., Hay, I.I., Prinsloo, J.G. and Ballard, R.C. A microbiological investigation of acute summer gastroenteritis in Black South African infants. *J. Hyg. Camb.* (1977) 78, 377-385.
- Taylor, P.R., Merson, M.H., Black, R.E., et al. Oral rehydration therapy for treatment of rotavirus diarrhoea in a rural treatment centre in Bangladesh. *Arch. Dis Child* (1980) 55, 376-9.
- Nalin, D.R., McLaughlin, J.C., Rahman, M., Yonus, M., and Curlin, G. Enterotoxigenic *Escherichia coli* and idiopathic diarrhoea in Bangladesh. *Lancet* (1975) 2, 1116.
- Echeverria, P.H., M.T. Blacklow, N.R., Quinnan, G., Portnoy, B., Olson, J.G., Conklin, R., DuPont, H.L. and Cross, J.H. Relative importance of viruses and bacteria in the etiology of Pediatric diarrhoea in Taiwan. *The Journal of Infectious Diseases* (1977) 136, 3, 383-390.
- Gross, R.J., Scotland, S.M. and Rowe, B. Enterotoxin testing of *Escherichia coli* causing epidemic infantile enteritis in the U.K. *Lancet* (1976) i, 629.
- Gribben, M., Walker-Smith, J. and Wood, C. A twelve month prospective survey of admissions to the Gastroenteritis Unit of a Children's Hospital. *Acta Paediatr Belg* (1976) 29, 69-77.
- Gobrach, S.L. and Khurana, C.M. Toxigenic *Escherichia coli*. A cause of infantile diarrhoea in Chicago. *New England Journal of Medicine* (1972) 287, 791.
- Echeverria, P., Blacklow, N.R. and Smith, D.H. Role of heat-labile toxigenic *Escherichia coli* and reovirus-like agent in diarrhoea in Boston Children. *Lancet* (1975) ii, 1113.
- Kumar, V., Murali Mohan, V., and Kumar, L. Fluid and electrolyte problems in acute gastroenteritis—correlation with nutritional status. *Indian Pediatrics*, (1977) XIV, 6, 449-453.
- Plank, S.J. Milanesi, M.L., W.H.O. Bulletin, (1973) 48, 203.
- France, G.L., Marmer, D.J. and Steele R.W. Breast-feeding and Salmonella infection. *Am. J. Dis Child*, (1980) 134, 147-152.
- Puffer, R.R. and Serrano, C.V. Patterns of mortality in childhood. *Scient. Pub. No. 262. Pan. American Health Organization, W.H.O.*—1973.
- Schoub, B.D., Prozesky, O.W., Lecatsas, G. and Oosthuizen, R. The role of breast-feeding in the prevention of rotavirus infection. *J. Med. Microbiol.* (1977) 2, 25-31.
- Walker-Smith, J.A., Harrison, M., Kilby, A., Phillips, A., and France, N. Cow's Milk sensitive enteropathy. *Archives of Disease in Childhood*, (1978) 53, 375.
- Manuel, P.D., Soeparto, P., and Walker-Smith, J.A. Cow's milk sensitive enteropathy, an important cause of chronic diarrhoea in Indonesian infants. *British Paediatric Tropical Child Health Group. British Paediatric Association 53rd Annual Meeting, York—1981.*
- The Lancet. Oral glucose/electrolyte therapy for acute diarrhoea, leading article, (1975) I, 79-80.
- Ksiazek, J., Milla, P. J. and Harries, J.T. The comparative effect of sucrose and glucose in modifying cholera toxin (CT) induced intestinal secretion. *British Paediatric Gastroenterology Group, British Paediatric Association 53rd Annual Meeting, York—1981.*
- Nalin, D.R., Mata, L., Vargas, W. et al. Comparison of sucrose with glucose in oral therapy of infant diarrhoea. *Lancet*, (1978), 1, 277.
- Estes, M.K. and Graham, D.Y. Epidemic Viral Gastroenteritis. *The American Journal of Medicine* (1979) 66, 1001-1007.
- Diarrhoea Dialogue. Appropriate Health Resources and technologies action group Ltd, a W.H.O. collaborating Centre, (1980) Issue No 1.
- Bertan, M. and Egeman, A. Oral rehydration therapy. The Turkish experience W.H.O. *Chronicile* (1979) 32, 132.
- Walker-Smith, J. Gastroenteritis, *Austr. Med. J.* (1972) 1, 329-332.

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National incomes and health: implications of some recent additions to the data

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Introduction

The period since 1945 has seen the emergence of aggregative economic concepts such as national income, gross domestic product and gross national expenditure as standard tools of economic analysis not only in the case of the developed countries but in virtually all developing countries and also in relation to global comparisons of national incomes and outputs. During the latter part of the same period it has been increasingly accepted that national accounting concepts can be used to provide information useful for the analysis of the determinants of the health status of populations, again at both the national and international levels. Of the possible links between national income and national health status, two have attracted particular attention. On the one hand, there is a strong statistical association between national *per capita* income and such indicators of national health status as infant mortality rates and life expectancy, suggesting some broad causal nexus between high incomes and better health. On the other hand, the national accounts provide a convenient framework for defining the share of a country's resources which is devoted to health services, either through the public or through the private sector, how these resources are provided and financed, and who are the beneficiaries.

Either of these types of relationship between income level and health may have considerable significance for the development of health on a global scale — that is, in practice, for the improvement of the health status of the populations of the developing countries. If emphasis is laid on the link between health and the general income level, improvements in health on the global scale depend on increasing incomes in the poorer countries of the world, which in current dis-

cussions is usually identified with a more equitable international distribution of income. If we emphasize the link between health status and the provision of health services, we have to consider in addition whether it is possible to increase the share of national resources going to health and the effectiveness with which they are used. In either case there is an urgent need for data which are accurate and comprehensive at the national level and comparable at the international level.

Unfortunately, in this area of convergence of national economic accounting and accounting for health sector resources, the data presently available have not been wholly satisfactory. The conventions of social accounting were initially developed from a point of view which was national rather than international, and economic (in the sense of being concerned mainly with material production) rather than social. The translation of national aggregates into international terms has almost universally been done by equating national currencies to the US dollar on the basis of market or official exchange rates. It has long been known that this is an unsatisfactory procedure, and particularly so in the case of services such as health care which do not enter into international trade. In the 1970s co-operation began between the World Bank, the UN Statistical Office and the University of Pennsylvania on the development of comparisons of gross domestic product based directly on purchasing power, rather than mediated by exchange rates. The results of this project are now becoming available on a substantial scale, and the light they throw on the development of better health in poor countries is discussed below.

During the 1970s there has also been a steady and unspectacular improvement in the national accounting data available for the developing countries. This is reflected in the increasing

number of countries for which plausible estimates of gross national product, national product *per capita*, and annual growth rates are published in such sources as the World Bank Atlas, and the growing number of years over which such estimates are available. For a limited number of developing countries these estimates include fairly reliable data on the product of the health sector which can be correlated with indicators of health status. Even without the added accuracy and realism given by purchasing power comparisons, these data permit us to draw some general conclusions about the influence of rising national incomes on health development, which are discussed in the following section.

The 1970s have also seen the continuation and expansion of another approach to the estimation of health sector resources in developing countries. In the 1960s WHO initiated a project for international comparisons of health expenditure whose reports laid the foundations for further work in this field. In particular, they identified many of the difficulties encountered in practice at the national level, and the main points at which national accounting conventions needed to be modified if expenditure data were to contribute effectively to the analysis of questions of health policy. WHO has now begun a programme of support to national efforts at analysis of health sector financing within a standard accounting framework, and detailed estimates for certain developing countries are becoming available (e.g. WHO 1977).

Finally, it should be mentioned that the UN Statistical Office has attempted to redress the bias of national accounting toward narrowly economic problems through proposals for the development of a System of Social and Demographic Statistics which would permit the linking of expenditures in the social sectors not only with the corresponding output of services but also with their impact on the welfare of the population. As originally envisaged, these proposals go considerably beyond the current discussions of 'social indicators', but they do not appear to have had so far the impact which their importance deserves.

The international distribution of income and its implications for health

There can be no doubt that the international distribution of income, product or any of the conventional economic aggregates is highly un-

equal. There is considerable evidence that there is close correlation between national income *per capita* and measures of national welfare such as mortality and literacy rates. These propositions have led some writers on development to very pessimistic assessments of the prospects for improvements in welfare among the populations of developing countries. The argument is seldom made entirely explicit, but put in its extreme form, and applied specifically to the health sector, it appears to be as follows. The correlation between national incomes *per capita* and indicators of health status, such as mortality rates, implies that no substantial improvements in the health status of the poorer countries can take place without a corresponding increase in their incomes. Such an increase in incomes implies a more equal distribution of incomes on the international scale. However, since the beginning of the UN First Development Decade in 1960 this distribution has grown more unequal, as is evidenced by the fact that the poorest countries show the lowest rates of growth of *per capita* incomes. Without massive specific interventions, we may expect the international distribution of incomes, and therefore also of health, to become even more unequal in the coming decades. Any substantial improvement in the health status of the poorest countries is therefore unlikely. While this argument appears plausible, it is argued here that it is subject to considerable qualification at almost every step, and that there is room for cautious optimism about the health status of the population of the developing countries.

The first point at which the pessimistic argument needs to be qualified concerns the evidence for increasing international economic inequality. A broad association between low *per capita* income and low past growth rates is not of great significance, since low incomes may be in part the product of earlier slow growth; one would expect such an association to be found even in a population in which income levels and growth rates were randomly associated. If there is a systematic tendency for poor countries to grow more slowly in economic terms, it should be reflected in prospective as well as past growth rates. Table 1 shows countries with populations of more than 1 million in 1978, classified by their *per capita* income level in 1960 and their average growth rate 1960-1976. (The data used in this table are taken from the 1978 edition of the *World Bank Atlas* which is a principal source

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Table 1. Population of countries with more than 1 million 1976, by national GNP *per capita* 1960 (in 1976 \$) and growth rate of GNP *per capita* 1960–1976*

Growth rate of GNP <i>per capita</i> , 1960–1976 (% p.a.)	1976 population (millions) of countries with 1960 GNP <i>per capita</i> of:							Total
	\$100	\$100<	\$200<	\$500<	\$1000<	\$2000<	\$5000 and over	
0	81.6	12.4	45.4	1.7	—	—	1.0	142.1
<1	12.0	65.1	1.8	—	2.8	—	—	81.7
≥1	28.7	663.0	65.3	40.6	1.1	—	—	798.7
≥2	3.9	48.7	103.4	82.6	12.4	73.9	221.5	546.4
≥3	5.4	211.3	111.7	77.3	329.7	138.1	8.2	881.7
≥4	—	45.2	8.3	151.1	43.1	75.0	—	322.7
≥5	1.2	835.8	89.9	80.7	163.9	—	—	1171.5
Total	132.8	1881.5	425.8	434.0	553.0	287.0	230.7	3944.8
Average growth rate:								
GNP	2.9	6.0	6.7	7.1	6.3	4.4	3.6	5.0
Population	2.5	2.1	2.6	2.7	1.1	0.8	1.1	1.9
GNP p.c.	0.4	3.9	4.0	4.3	5.1	3.7	2.5	3.1

* Source: *World Bank Atlas* (1977).

of data on international economic development.) The table shows that the lowest growth rates were experienced by those countries which had in 1960 either very low incomes (less than US \$100 *per capita* at 1976 prices) or very high incomes (more than \$5000 *per capita*). Over the intermediate range any association between income level and growth rate is much weaker, with the maximum growth rate being in the income group \$1000–1999 *per capita*. If such a pattern were projected into the future, one would expect it to produce little change in the overall concentration of income, but with some movement in favour of middle income countries as against both the poorest and richest. This is confirmed by a calculation for 1960 and 1976 of the coefficient of concentration of the country income data shown in Table 1; the coefficients for 1960 and 1976 are almost identical (0.822 and 0.819).

It is worth noting that one's interpretation of such data may depend critically on one's evaluation of the estimates for a small number of countries. Thus in Table 1 the lowest income category is dominated by Bangladesh, a country whose rate of growth has been deeply affected by the events surrounding the war of liberation in 1971, and which had no separate political existence before that date. The next income category is dominated by India and China, which between them account for about one third of the population of the countries covered by the

table; in neither case is the statistical basis for the *World Bank Atlas* growth rate entirely satisfactory.

Constancy in the degree of concentration of international incomes does not rule out a substantial increase in the *per capita* income of the poorest countries. Given a continuation of the growth of average *per capita* GNP at the same rate as between 1960 and 1976, and no change in the pattern of distribution, by 2000 the proportion of the world's population in each income group will be approximately as shown in Table 2. The proportion in countries with *per capita* GNP of less than \$500 (at 1976 prices) is projected to fall from 57% in 1976 to 24% in 2000.

One would expect such a shift in income levels to be accompanied by an improvement in national health status. On the basis of the observed correlation between national *per capita* incomes and national infant mortality rates (see the following section), one can roughly equate a *per capita* income level of \$500 with an infant mortality rate of 45, and a *per capita* income of \$1000 with an IMR of 30. On the basis of Table 2, therefore, one would expect that by 2000 the proportion of the world's population in countries with IMRs of 50 and over would have fallen to about 25%, with another 30% in countries with IMRs between 30 and 50. Since infant mortality is generally accepted as a good indicator of general health status, these projections imply that by the year 2000, 75% of the world's

Table 2. Population of countries with more than 1 million population 1976: percentage distribution by income groups (GNP *per capita*), 1976 and projected 2000*

GNP <i>per capita</i> (1976 \$)	Population (%)	
	1976	Projected 2000
<100	2.1	1.0
>100	22.5	1.0
>200	32.4	21.6
>500	5.1	31.3
>1000	9.7	6.9
>2000	14.6	9.6
>5000	13.7	28.6
Total	100.0	100.0

* Source: Data in *World Bank Atlas* (1978). Projections for 2000 assume income (GNP *per capita*) distribution in 2000 same as 1976; growth rate of world GNP *per capita* 1976-2000 same as 1960-1976.

population will have attained approximately the status of the poorer European countries in 1960.

The foregoing projections can be argued to be optimistic in that they assume a continuation of the average growth rates of 1960-76. On the other hand, they contain certain pessimistic elements in that they make no allowance for the effect on *per capita* incomes of falling rates of population growth, and take no account of possible technical advances in medicine. On balance, such projections seem to establish at least the possibility that the health status of the populations of the developing countries will improve substantially by the year 2000 even without massive diversion of resources to the health sector.

Direct national comparisons of purchasing power and their implications for health

Reference was made in the introduction to the development of international comparisons of real product and purchasing power under a project supported by the World Bank and UN Statistical Office. The first report on this project, devoted to methodological issues and to preliminary estimates of real GNP for 10 'Stage I' countries, appeared in 1975 (Kravis *et al.* 1975). A second report, giving detailed estimates for 16 'Stage II' countries, appeared in 1978 (Kravis *et al.* 1978).

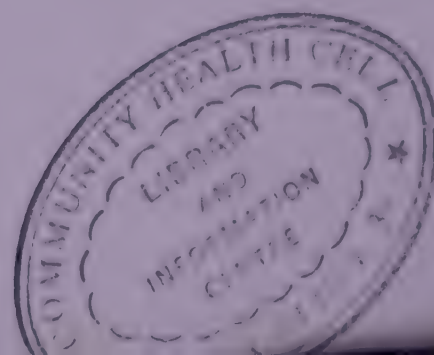
The most striking result of the project is the apparent narrowing of the income gap between poor and rich countries which is produced by a shift from the 'exchange rate' basis of comparison to a 'purchasing power' basis. Estimates of *per capita* GDP in 1970 on each basis for the 16

Stage II countries are shown in Table 3. It can be seen that for India, for example, the estimate of *per capita* GDP on an exchange rate basis is 2.1% of that of the United States, whereas on a purchasing power basis the proportion is 6.9%. The change in valuation is greater for services (which do not enter into international trade) than for goods (which are generally tradeable, and whose price ratios from one country to another are therefore reflected in the exchange rates); and there is a fairly consistent relationship between the poverty of a country and the discrepancy between the purchasing power and exchange rate estimates.

However, this aspect of the results is of less significance than appears at first. It has never been supposed that the absolute value of income *per capita* was crucial in international comparisons; of more importance is the interpretation of the income estimates in terms of welfare and equity. On the side of equity, it should be kept in mind that the purchasing power comparisons still show the distribution of income between countries as being highly unequal. For example, for the 16 Stage II countries the shift to a purchasing power basis reduces the Gini coefficient of concentration of income only from about 0.80 to about 0.75. Further, it leaves the ranking of countries in terms of *per capita* GDP as almost unchanged.

On the welfare side, the revised estimates do imply that the level of welfare in the poorest countries is potentially greater than would have been assumed from exchange rate-based com-

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Table 3. Sixteen 'Stage II' countries: *per capita* GDP 1970 as % US level, on exchange rate basis and purchasing power basis*

Country	Per capita GDP 1970 as % US level:	
	Exchange rate basis	Purchasing power basis
Kenya	3.0	6.3
India	2.1	6.9
Philippines	3.9	12.0
South Korea	5.4	12.1
Colombia	7.2	18.1
Malaysia	8.1	19.1
Iran	8.4	20.3
Hungary	21.6	42.7
Italy	35.9	49.2
Japan	39.8	59.2
United Kingdom	45.7	63.5
Netherlands	50.8	68.7
Belgium	55.1	72.0
France	58.3	73.2
West Germany	64.1	78.2
United States	100.0	100.0

* Source: Kravis *et al.* (1978) Table 1.9.

parisons, in that the volume of services is larger. They do not, of course, affect assessments of welfare based on non-economic indicators such as mortality and literacy rates.

It should be pointed out that while the purchasing power basis of comparison removes one source of distortion in international comparisons, the figures are subject to other well known limitations as measures of welfare — for example, the exclusion of the value of the work of women within the home and the uncertainty about the welfare value to be attached to expenditure on the armed forces.

It appears to be too early to assess the effect of the revised basis of comparison on rates of growth of real income. One would expect on *a priori* grounds that although the new estimates narrow the apparent income gap between poor and rich countries, they are also likely to reduce the apparent growth rates, with little overall effect on the time likely to be required for a country to move from one level of *per capita* real income to a given higher level. The limited data so far published suggest that this view may be too pessimistic, but the results are clearly not conclusive.

It may be, therefore, that the main contribution of the techniques of purchasing power comparison to the study of development will be in permitting better analysis of the structure and functioning of particular sectors on an international scale. Some possible lines of investigation

are considered here in particular relation to the health sector; they include the balance between the public and private sectors, the structure of inputs and prices, and the overall efficiency of the health services.

Balance of public and private sectors

The data used in this and the following sections are taken from the most recent ICP report (Kravis *et al.* 1978) which gives estimates for the 16 Stage II countries and for the years 1970 and 1973, of expenditure in national currencies and at international prices on each of 153 subheads of the GDP, as well as for various groupings of these into broader heads. Seven sub-heads cover the greater part of expenditure on health care (drugs and medical preparations, medical supplies, therapeutic equipment, physicians' services, dentists' services, nurses' and other health workers' services, hospitals). While in the main tables all expenditure on these items, public or private, is shown under the single heading of 'consumption', Table 2.1 of the report shows the expenditures which had been recorded in the national accounts of the countries concerned as part of Government Final Consumption Expenditure, and the expenditures taking place on these items under the national accounts heading Personal Consumption Expenditure can be obtained by difference.

Table 4 shows the share of the government sector in health care expenditure for the 16

Table 4. Sixteen Stage II countries: Government expenditure as % total expenditure (total final consumption expenditure) on health care, 1970*

Country	Government as % total expenditure			
	Drugs and supplies	Health personnel	Hospital services	Total
Kenya	6.5	47.1	47.2	41.1
India	4.6	34.3	65.2	32.6
Philippines	10.5	12.8	29.8	18.6
South Korea	4.1	4.1	4.0	4.1
Colombia	—	34.6	14.6	19.3
Malaysia	17.0	72.4	66.4	56.5
Iran	15.8	18.8	15.8	15.8
Hungary	82.1	93.9	92.6	91.0
Italy	0.1	13.8	65.1	25.3
Japan	9.9	60.8	12.9	22.2
United Kingdom	59.8	89.2	98.9	81.6
Netherlands	0.6	20.1	15.8	10.4
Belgium	11.7	33.6	85.9	39.9
France	0.2	23.1	15.4	8.3
West Germany	8.5	22.8	69.8	31.1
United States	48.9	15.8	13.4	26.3

* Source: Kravis *et al.* (1978), Tables 2.1, 4.1, 4.5.

Stage II countries in 1970. This table relates to current expenditure only; no comparable breakdown is available on the side of capital expenditure. It can be seen from Table 4 that the share of the government sector in health care expenditure varies widely among the 16 countries (from 4% in South Korea to 91% in Hungary). No simple dichotomy into 'public' and 'private' national health systems appears possible. However, Hungary and UK, with more than 80% of expenditure taking place through government, may reasonably be classed as predominantly public, while countries with less than 20% of expenditure through government (Philippines, South Korea, Colombia, Iran, Netherlands and France) can be considered predominantly private.

Table 4 also shows the corresponding percentage for three broad types of health care expenditure — on drugs and medical supplies, on the services of health personnel, and on the other costs of hospitals and health institutions. In all countries private expenditure forms a substantial proportion of expenditure on drugs, being as high as 18% even in Hungary, and exceeding 80% in all the developing countries in the table. The public share in the other two categories is generally higher, and a country with a high public share in one category also tends to rate high on the other, but this tendency has some conspicuous exceptions. The breakdown by categories emphasizes the difficulty of classifying a coun-

try's health system as unambiguously 'public' or 'private'.

Structure of inputs

Expenditure at international prices provides a convenient basis on which to categorize the input structure of national health systems. The available data do not permit much disaggregation, but current expenditure can conveniently be broken down into three categories — drugs and supplies, services of health personnel, and running costs of hospitals and other health institutions. The second category can in turn be divided between physicians and dentists, and other health personnel. The proportionate importance of each category in total health care expenditure is shown for each country in Table 5. There is a clear tendency for the developing countries to rely less on drugs than the developed, but the balance between services and hospital expenditure shows no clear pattern. Within the expenditures for health personnel, the major share in all countries is attributable to the services of physicians, but there are two countries, Kenya and Malaysia, which fall markedly below the average in this respect. These are the only two countries out of the 16 which place substantial reliance on health personnel other than physicians, and they are also the two developing countries with the highest government share in the health sector. It is possible that

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Table 5. Sixteen Stage II countries: Expenditure on main categories of current inputs to health care as % total expenditure, 1970*

Country	Expenditure at international prices as % total health care expenditure			Expenditure on physicians as % expenditure on health personnel
	Drugs and supplies	Health personnel	Hospital services	
Kenya	14.9	45.1	40.0	52.3
India	28.2	50.4	21.4	90.2
Philippines	27.3	32.3	40.4	79.8
South Korea	30.4	63.0	6.7	84.7
Colombia	11.6	58.0	30.4	83.4
Malaysia	23.9	31.1	45.0	61.3
Iran	54.5	35.6	9.9	90.8
Hungary	21.2	50.8	28.0	80.3
Italy	32.9	36.3	30.8	93.8
Japan	51.7	22.7	25.6	80.7
United Kingdom	36.1	33.6	30.4	76.7
Netherlands	43.2	27.3	29.5	81.1
Belgium	38.6	33.2	28.2	90.0
France	59.6	25.4	15.0	83.7
West Germany	35.1	36.4	28.5	86.3
United States	38.2	41.8	20.0	76.9

* Source: Kravis *et al.* (1978), Table 4.5.

Table 6. Sixteen Stage II countries: Expenditures *per capita* on building of health institutions, at international prices, 1970*

Country	Expenditure on hospital building 1970 expressed as % of			
	\$ per capita (international prices)	Current hospital expenditure	Current health expenditure	Total capital formation
Kenya	0.76	15	6	1.7
India	0.41	18	4	0.8
Philippines	0.58	12	5	0.8
South Korea	3.13	210	14	3.6
Colombia	0.22	2	1	0.1
Malaysia	3.37	23	10	1.6
Iran	1.02	39	4	0.5
Hungary	3.35	9	3	0.6
Italy	5.24	12	4	0.8
Japan	10.43	19	5	1.0
United Kingdom	9.74	23	7	1.4
Netherlands	39.86	79	23	4.1
Belgium	1.72	4	1	0.2
France	7.97	25	4	0.7
West Germany	17.84	34	10	1.3
United States	13.47	38	8	1.4

* Source: Kravis *et al.* (1978), Appendix Table 4.5.

statistics such as these may form the basis of an indicator of the extent to which countries are orienting their health policies in the general direction of 'primary health care'.

The only health-related item of capital formation on which the present data throw light is the *per capita* expenditure on the building of hos-

pitals and other health institutions. This is shown in absolute terms in Table 6, and also in relation to current hospital expenditure, current health care expenditure and total capital formation. It can be seen that this item is in all cases small in relation to total capital formation and in very few cases does it appear substantial in relation to

total current health expenditure. This confirms the observation that the capital aspect of hospital and health centre construction in developing countries is not a serious direct constraint on health development, in spite of the importance often attached to it in development plans and under overseas assistance; its importance for planning lies in its implications for future current expenditure and for the distribution of health resources.

The present data suggest a broadly similar input mix for all the countries examined, with roughly equal proportions of expenditure (at international prices) on drugs, services of health personnel and hospital running costs. There is some tendency for the developing countries to have smaller proportionate inputs of drugs than the developed, and it is also among the developing countries that one finds examples of unusually low inputs of physicians' services compared with those of other health personnel. However, the variations between countries in all respects are more striking than the differences between the developing countries as a group on the one hand, and the developed countries on the other.

Structure of relative prices

The purchasing power comparisons in the 1978 report (Kravis *et al.* 1978) are based on extensive collections of country prices, but the volume of this data is obviously much too great for it to be reproduced in the report. However, the material published in the report can easily be manipulated to give relative prices, and it is these which form the basis of the analysis in this section. The procedure used is to take, for a given category of expenditure on GDP in a given country, the expenditure in terms of the national currency (Appendix Table 4.1 of the report), and to translate it into US dollars on an exchange rate basis. The resulting dollar price is then divided by the expenditure on the given category at international prices (Appendix Table 4.5 of the report) to give a measure of relative prices. The relative price, in this sense, may be seen as a reflection of two forces. One is the extent to which exchange rate comparisons differ from comparisons at 'international' prices; this effect varies from country to country but is the same for all items within a given country. The other factor is the differences within each country in the relative price structure. The absolute levels of the international prices used in the report are arbitrary since they have been adjusted in such a way that over all

items of expenditure the international dollar has the same purchasing power as the US dollar in 1970.

As an example, the relative price for health care for Kenya in 1970 on the basis of the report data was 0.42. This may be seen as reflecting the overall ratio of local prices (translated at current exchange rates) to international prices for the Kenyan GDP in 1970 — this ratio being 0.44; and the extent to which the price of health care was lower, in relative terms, than the prices of other commodities and services making up the GDP — this being measured by the ratio of 0.42/0.44, or 95.5%.

Table 7 shows, for the 16 Stage II countries, the price relatives for the GDP as a whole (excluding capital formation), for current expenditure on health care, and for the three main groups of current inputs into health care (drugs and supplies, services of health personnel, and running costs of hospitals). In most cases the relative price of health care is less than that of the GDP as a whole, but with certain clear exceptions (Philippines, Colombia, Iran, US). The relative price of drugs and supplies does not vary greatly as between the developing and developed countries, while the relative price of the services of health personnel is very much lower in the developing countries than in the developed countries (an exception is Hungary, with a very low reported price of health personnel services). The relative prices of hospital services show no clear pattern of variation from country to country, and indeed are so erratic as to suggest that the item may not be comparable between countries.

These data confirm the generalization that the prices of drugs are higher in relation to the prices of health personnel services in developing than in developed countries. However, they do not suggest the idea that drug prices are absolutely higher in developing countries. It should be noted that the pattern of relative prices for drugs and for health personnel services is very much the same as that for all goods and for all services suggesting that the differentials observed are caused by factors not peculiar to the health sector.

On general economic grounds, one would expect the pattern of relative prices to provide a partial explanation of the intercountry differences in input structure discussed in the preceding section. First, one would expect that at a given level of income, the quantity of health care

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Table 7. Sixteen Stage II countries: Relative prices for GDP (excluding capital formation), health care, and main categories of health inputs, 1970*

Country	Relative prices 1970				
	Drugs and supplies	Health personnel	Hospital services	Total health care	GDP (excluding capital formation)
Kenya	0.60	0.28	0.51	0.42	0.44
India	0.44	0.11	0.09	0.18	0.29
Philippines	0.49	0.38	0.15	0.39	0.29
South Korea	0.30	0.14	0.96	0.25	0.43
Colombia	1.22	0.40	0.43	0.50	0.40
Malaysia	0.47	0.46	0.11	0.30	0.43
Iran	0.46	0.38	1.18	0.50	0.40
Hungary	0.51	0.12	0.42	0.29	0.46
Italy	0.76	0.61	0.21	0.56	0.76
Japan	0.52	0.22	0.31	0.40	0.65
United Kingdom	0.47	0.84	0.67	0.66	0.75
Netherlands	0.63	1.34	0.11	0.67	0.77
Belgium	0.62	1.36	0.36	0.79	0.77
France	0.62	1.62	0.23	0.81	0.83
West Germany	1.04	1.20	0.22	0.86	0.90
United States	1.19	1.54	3.52	1.80	1.03

* Source: Kravis *et al.* (1978), Appendix Table 4.1, 4.5.
 N.B. Relative price for US GDP 1970 = 1.00.

services consumed would vary inversely with the price of such services relative to other items in the GDP. A test of this hypothesis was included in the 1978 ICP report (see Table 6.3, item 'Medical Care', and accompanying text) and the result of the test is positive – more so, indeed, than for most other items of consumption.

As a second step, one can hypothesize that the use of the individual inputs to the health care system – drugs, physicians' services, etc. – will vary inversely with their relative price. This also is tested in the 1978 report (Table 6.4), and the results again confirm the hypothesis, though at a lower level of statistical significance than for health care as a whole. The highest price elasticity is found in the case of drugs (–0.84) and the lowest in the case of dentists' services (–0.15).

One can go further and ask whether the data throw any light on the determinants of relative prices. Here the evidence is no more than suggestive, but it may be worth drawing attention to the fact that the two countries with state-controlled health care systems, Hungary and UK, appear to have lower relative prices for drugs than other countries of similar income level, and that among the developing countries drug prices appear to be relatively low in India and South Korea, which have substantial domestic pharmaceutical industries.

The price of the services of health personnel is largely determined by the price of physicians' and dentists' services, which account for about 80% of expenditure under this head (lower percentages are found only in Kenya, Malaysia, UK and US). The price of physicians' services presumably reflects closely the incomes of physicians. By combining the ICP data with published data on population per physician, it is possible to make very tentative estimates of average incomes of physicians in each of the Stage II countries and relate them to *per capita* GDP. Very impressionistically, the results suggest that for high income countries the income of physicians is between 10 and 20 times the *per capita* GDP; for the lower part of the range of the developed countries it is 5–10 times the *per capita* GDP (for the UK, for instance, it appears to be about 5.5 times), while for the developing countries it varies very widely, with some suggestion that an important influence is the restrictiveness of the definition of physician. Thus physicians' incomes appear to be much lower in India (with its relatively large numbers of domestically trained Western and Ayurvedic practitioners) than in Kenya, though the countries have much the same level of *per capita* GDP.

So far we have discussed the prices of current inputs to the health care sector. It is possible to

Table 8. Sixteen Stage II countries: Relative prices of selected types of capital goods and of total capital formation, 1970*

Country	Relative price 1970			
	Hospital construction	Transport equipment	Electrical equipment	All capital formation
Kenya	0.55	0.61	0.76	0.64
India	0.23	0.62	0.80	0.33
Philippines	0.34	2.07	1.57	1.04
South Korea	0.70	0.95	0.52	0.50
Colombia	0.33	0.63	0.90	0.40
Malaysia	0.28	0.73	0.85	0.42
Iran	0.28	0.68	0.75	0.45
Hungary	0.49	0.62	0.55	0.63
Italy	0.78	0.61	0.54	0.65
Japan	0.62	0.56	0.69	0.71
United Kingdom	0.72	0.67	0.65	0.64
Netherlands	0.61	0.85	0.76	0.67
Belgium	0.80	0.81	0.72	0.75
France	0.84	0.56	0.61	0.71
West Germany	0.72	0.62	0.67	0.69
United States	1.24	0.53	0.76	0.90

* Source: Kravis *et al.* (1978), Appendix Tables 4.1, 4.5.

use the ICP data to throw some light on the prices of capital goods. Table 8 shows the relative prices of three capital items relevant to the health sector — hospital buildings, transport equipment and electrical equipment. The conventional wisdom says that in developing countries capital is scarce, and therefore expensive, relative to other inputs. The data show that the situation is a little more complex than that. The relative price of transport and electric equipment is much the same for developing and developed countries. The price of hospital building construction (which includes a large labour component) is substantially less in developing than in developed countries, though with considerable variations within each category; to take the extreme cases, in India it is only one fifth that in the US. This suggests that one should be cautious in generalizing about the appropriate balance between capital and current inputs to the health sector in developing countries.

At this point in the analysis it may be as well to emphasize that the ICP data were collected for aggregative purposes, and that in using them for a detailed examination of a particular sector we may be pushing them to the limit of what the data and methodology will bear. Nevertheless at least two broad conclusions seem permissible. One is that even as between developing countries, the economic dimensions of the health care sector — inputs, output and prices — are more

varied than is sometimes allowed; the other is that a substantial part of the variation may be explainable in terms of fairly obvious variables such as incomes, prices and the role of government.

Efficiency of the health care sector

The ICP purchasing power parity data enable us to measure the main inputs into the health care sector of the countries covered on a common basis of international prices. It seems natural to ask whether we can link such an input measure with a measure of output so as to obtain an estimate of the efficiency of resource use. The output of the health care sector may be seen from at least two points of view. One is the consumer satisfaction obtained from the services provided; for this it does not seem possible to obtain an international measure which is independent of the input side. From another point of view, the output of the health care sector is the health status of the population, and here there is a better hope of finding an independent and objective measurement, or at least a useful indicator.

In the present section, for exploratory purposes, the Infant Mortality Rate is used as such an indicator. It has been chosen because it is a well-established statistic, available for most developing countries, and believed to correlate well with other measures of current health status.

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Table 9. Income-standardized proportionate measures of input mortality rate and of health care expenditure at international prices, 1970*

Income-standardized proportionate rates 1970		
Country	IMR	Health care expenditure per capita
Kenya	0.94	1.31
India	0.99	1.18
Philippines	1.01	0.52
South Korea	0.59	1.12
Colombia	1.80	0.81
Malaysia	0.61	0.95
Iran	2.96	0.69
Hungary	1.33	1.36
Italy	0.93	1.37
Japan	0.49	1.87
United Kingdom	0.94	0.86
Netherlands	0.62	1.09
Belgium	1.00	0.76
France	0.88	1.29
West Germany	1.19	1.07
United States	1.47	0.62

* Sources: IMR – *World Atlas of the Child*, World Bank.
Other – Kravis *et al.* (1978).

Regression equations used to derive income-standardized rates:
X = log₁₀ (GDP [excluding capital formation] per capita, 1970)
Y = log₁₀ (IMR 1970)
 $y = 4.4701 + (-0.9316) x \quad r = -0.8701$
X = log₁₀ (GDP [excluding capital formation] per capita, 1970)
Y = log₁₀ (Health care expenditure per capita at international prices, 1970)
 $y = -2.2018 + 1.3054 x \quad r = 0.9581.$

Data used are for 1970 and have been taken from the World Bank's *World Atlas of the Child*.
For a meaningful calculation of efficiency it is necessary to make some assumption about the nature of the relation between inputs (expenditure on health care) and output (infant mortality as an indicator of health status). It is assumed here, on the basis of the literature and of preliminary calculations, that the most important determinant of health status is the country's income level (as represented by GNP per capita), and that the regression of IMR on per capita GNP (both in logarithmic form) is linear. This regression relationship has been used to calculate for each of the 16 Stage II countries an IMR based on the country's per capita GNP, and the observed IMR has been expressed as a proportion of this. Per capita health care expenditure at international prices is also highly correlated with per capita GNP, and a similar standardization procedure has been applied (Table 9).
The data suggest, as one would expect, an inverse relation between the standardized pro-

portionate health care expenditure estimates and IMRs. The simplest statistical procedure that shows a reasonable fit is again a linear regression in the logarithms, with a b value of -0.70 and an r² of 0.275. This can be interpreted to mean that about a quarter of the variance of the income-standardized IMR is accounted for by its association with the standardized health care expenditure, and that an increase of 1% in proportionate health care expenditure is associated with a decrease of 0.7% in the proportionate IMR.
One possible summary measure of efficiency, attractive because it is dimensionless, is the ratio between the actual standardized IMR and the standardized IMR predicted on the basis of the above regression relationship. This is shown in column A in Table 10. The highest efficiency shown is for Malaysia (1.70) and the lowest that for Iran (0.44). While many of the values in the table appear plausible, some show deviations from what would be expected on general grounds which suggest defects in the underlying data. For

Table 10. Alternative measures of efficiency of health sector (see text)*

Country	Measures of relative health sector efficiency:		
	A	B	C
	Predicted/ actual IMR	A X predicted IMR predicted health care expenditure	relative price of health care B
Kenya	0.88	10.24	24.38
India	0.90	9.42	52.33
Philippines	1.57	3.83	9.82
South Korea	1.56	2.98	11.91
Colombia	0.64	0.79	1.59
Malaysia	1.70	2.14	7.12
Iran	0.44	0.28	0.55
Hungary	0.61	0.12	0.41
Italy	0.86	0.18	0.24
Japan	1.31	0.16	0.40
United Kingdom	1.18	0.09	0.14
Netherlands	1.52	0.13	0.20
Belgium	1.21	0.07	0.09
France	0.95	0.06	0.08
West Germany	0.80	0.06	0.07
United States	0.95	0.03	0.01

* Sources: as for Table 9.

Predicted IMR, Health Care Expenditure in Cols. B, C based on regression equations specified in Table 9.

Predicted IMR in Column A based in addition on the following regression equation:

$X = \log_{10}$ (income-standardized proportionate HCE 1970)

$Y = \log_{10}$ (income-standardized proportionate IMR 1970)

$y = -0.0003 + (-0.7025)x$

$r = -0.5247.$

example, a low value for Colombia is not unexpected, but the apparently high efficiency for Philippines does not seem to correspond with what is known of health service organization in that country.

While the above measure of efficiency is a useful exploratory device, for operational purposes one would prefer one which gave a more direct indication of the change in infant mortality to be anticipated from variations in health care expenditure. The standardized proportionate rates are misleading for this purpose since among developed countries the proportions are to be applied to low absolute levels of IMRs and high absolute levels of health care expenditure, and conversely for developing countries. If the 'A' measure of efficiency is adjusted by multiplying in each case by the (predicted) IMR and dividing by the (predicted) level of health care expenditure, we obtain the measures shown under B in Table 10. These can be interpreted as showing the reduction in IMR which would be brought about by applying an additional quantum *per*

capita of health care resources in each country. (The quantum of resources is assumed to be represented by a given expenditure at international prices.) For example, the reduction in IMR in Kenya would be approximately 300 times as great as in the US.

For some purposes (e.g. for an international agency allocating a dollar budget among different countries) it would be relevant to take account of the differing levels of prices of health care inputs between countries. This can be done by adjusting the measures under B by the relative prices for health care inputs as a whole in each country. Measures adjusted in this way are shown under C in Table 10. The estimates shown imply that, for example, a given dollar increase in *per capita* health care expenditure would be 2400 times as effective in reducing infant mortality in Kenya as in the US.

It should be emphasized that these estimates are highly tentative. Their use appears to be, first, as a means of checking the plausibility of the basic data (since inaccurate estimates of health

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care expenditure and of IMRs are likely to show up in anomalous measures of efficiency); and second, as a step toward developing a predictively useful model of the relation between economic quantities, patterns of health service organization and national health status.

Conclusions

The data and discussion above seem to lead to two types of conclusions. There are, first, certain substantive conclusions about policy toward health development in the Third World, which can be summarized as follows:

(a) Even using the presently available approaches to health care, there is reason to expect substantial improvement in health status in the developing countries by the year 2000 based on the following factors:

(i) the growth of *per capita* incomes for reasons external to the health sector, if this growth is comparable in magnitude with that which took place in the period 1960–1976;

(ii) any additional increases in the *per capita* resources, current and capital, devoted to health care;

(iii) improvements in the efficiency with which inputs are applied in the health sector so as to bring all countries up to the level of the presently most efficient (including a 'levelling down' of drug prices between countries and an economic balance between inputs according to their true relative scarcity).

(b) Foreign assistance to the health sector will be most effective if it concerns current rather than capital inputs (since there is no evidence that the latter are a constraint on health development) and if it takes the form of money or scarce equipment rather than the services of health personnel (since the latter are relatively cheap in developing countries).

These substantive conclusions can only be tentative given the limitations on the available data and on the resources so far devoted to its analysis. They therefore lead to certain further recommendations:

(c) Efforts should be continued to improve the data on health inputs and outputs on the international scale.

So far as economic data are concerned, this could most profitably be done by collaboration between agencies within the health sector (e.g. WHO's current programme on the financing of health services) and agencies with a more general economic responsibility (e.g. IBRD, UNSO).

(d) As further data become available they should be used to confirm, extend or refute the type of analysis carried out in this paper. This activity in turn would feed back to influence the direction of effort under (c).

(e) Quantitative policy analysis should be regarded as a useful stage in the formulation of national and international health development programmes (e.g. 'Health for All by the Year 2000') and not left entirely to academic research.

References

- Kravis I. B. *et al.* (1975) *A System of International Comparisons of Gross Product and Purchasing Power*. Johns Hopkins University Press
- Kravis I. B. *et al.* (1978) *International Comparisons of Real Product and Purchasing Power*. Johns Hopkins University Press.
- UN Statistical Office (1974) *Towards a System of Social and Demographic Statistics, Studies in Methods*, Series F, No. 18. New York
- World Bank (1978) *World Bank Atlas*. World Bank, Geneva
- World Bank (1970) *World Atlas of the Child*. World Bank, Geneva
- World Health Organization (1977) *Financing of Health Services. Technical Reports Series*, No. 625. WHO, Geneva

Primary Health Care in the District of Al Asiah

Zohair A. Sebai

ملخص: أجريت هذه الدراسة على مركزين صحيين في قريتي العين والخصيبة بمنطقة القصيم ، وهي جزء من دراسة شاملة للوضع الصحي في القريتين قامت بها كلية الطب بجامعة الرياض . أوضحت الدراسة ان العمل الأساسي لكل من المركزين الصحيين هو تقديم الخدمات العلاجية لمرضى العيادات الخارجية . أما الاهتمام بالجوانب الوقائية والتطوير الصحي فهو محدود . وينتهي الباحث الى ان نوعية التعليم الطبي الذي يتلقاه الطبيب والمساعدان هو العامل الأساسي الذي يحدد اتجاههم واسلوبهم في تقديم الرعاية الصحية .

Summary: In this study we describe the function of two health centres in Ain and Khusaiba villages in the Qasim region. It was part of a comprehensive survey in the two villages. The study showed that the main function of the two health centres is to provide out-patient curative health services. Little is being done for prevention of diseases or for promotion of health. It is the medical education of physicians and of their assistants which is the main contributing factor behind their attitude and practice.

Introduction

This study aims at describing the function of two health centres in the villages of Ain and Khusaiba in the Qasim region. The two centres under study are not representative of other health centres in Qasim. However, evidence suggests that they are not different from others in Saudi Arabia (Sebai *et al.* 1980).

During the two-week stay in the villages the author, assisted by two students, studied the function of the two centres, observed the health personnel at work, scrutinized the records and interviewed people. The statistical data presented are mainly from the records of 15 working days in January 1980.

Each of the two health centres under study is situated in a rented mud house. The 10 rooms in each centre are used for clinics, a pharmacy, dressing rooms, and storage. Two rooms are kept as the residence for the female nurses. In Ain there is a small laboratory which is not functioning at present. The health services in the two centres are based on out-patient care with very few services extended to the community.

Each health centre is staffed by 2 physicians (a husband and wife), two nurses and a pharmacy assistant. The two physicians working in Khusaiba are from Bangladesh, while the rest of the personnel in the two centres are from Arab countries (mainly Egypt). The only Saudi health worker is a male nurse in Ain.

The four physicians in the two health centres are general practitioners who graduated about 1970. Their period of stay in the country varies from 1 to 5 years. Each of the other health personnel has a basic education of 9-12 years plus 2-3 years training. The Saudi nurse has only primary school education and no formal training.

The physicians in charge of the health centres refer directly to the Regional Director of Health Services in Qasim. Two or three times a year an inspector from the Regional Office visits the health centres.

The health services rendered by the two health centres will be discussed under two headings, curative and preventive services.

Curative Services

Table 1 shows the age and sex distribution of those who attended the two health centres during 15 working days. The average number of daily attendances is 90 in Ain and 68 in Khusaiba. In summer the rate of attendance increases by 20%. Eighty per cent of those attending are Saudis.

Although the two health centres serve 12 rural communities in an area of about 750 km², 66% of the people attending Ain Centre and 54% at Khusaiba Centre come from within a range of 5 km. Thirty-seven per cent are under 12 years of age which is low in a community where children constitute half the population. In general there are fewer females than males. It is likely that health services are most used by male adults.

The time spent by the physician in seeing his patients was observed and recorded. On average the physician in Ain spent 50 minutes seeing 21 patients (2.4 minutes per patient) and the physician in Khusaiba spent 25.6 minutes attending 17 patients (1.5 minutes per patient). On average, the physicians spent two minutes per patient.

Further analysis of the time spent by the male physician in Ain shows that on average he spends 0.6 minutes for history taking, 1.3 minutes for physical examination and 0.5 minutes for prescription writing and guidance of the patient. This is not different from the findings in a study of three health centres carried out in the western part of the country (Sebai *et al.* 1980).

Table 1
Number of out-patients attending Ain and Khusaiba health centres in fifteen days

	Age groups				Total
	0-12 years		> 12 years		
	Male	Female	Male	female	
Ain	245	202	459	443	1349
Khusaiba	214	216	336	258	1024
Total	459	418	795	701	2373

Forty-four patients (16 male and 28 female) were interviewed after they had been seen by one physician. Ninety-one per cent could not state the diagnosis of their ailments. They only mentioned their complaints. Fifty-two per cent did not know how to use the prescribed medicine properly.

Table 2 shows the diagnoses of patients who visited the two health centres over 15 days, as recorded in the physician's book. Diagnosis is made on the basis of patient complaint and is recorded in general terms such as diseases of skin, eye, ear, kidney, etc. There is a lack of precision in recording: for example, 'conjunctivitis' in Ain is recorded as 'eye disease' in Khusaiba.

The ratio of Ain to Khusaiba attendants is almost equal (1.3:1). One would not expect much difference in age and sex distribution or in specific health problems recorded at the two centres, since the two communities differ little in their health problems and population pattern. But in fact the recordings make a different picture:

Table 2
Diagnosis of cases attending the centres in 15 working days (2373 cases)

Diagnosis	No. of patients	
	Ain	Khusaiba
Common cold	63	224
Tonsillitis	85	79
Diarrhoea	96	68
Rheumatism	36	185
Diseases of skin	100	77
Bronchitis	293	
Conjunctivitis	212	
Moniliasis	43	
Colic	76	
Gastritis, hyperacidity	150	
General weakness	61	
Measles	2	
Dysentery	89	
Hypertension	9	
Pneumonia		15
Disease of ear		42
Disease of eye		111
Disease of tooth		28
Disease of kidney		8
Bronchial asthma		8
Communicable diseases		2
Chest pain		25
Others	34	152
Total	1349	1024

there are many diseases which are recorded in one health centre but not in the other, e.g. moniliasis, gastritis, general weakness and diseases of the ear, teeth and kidneys, etc.

Table 3 shows the drugs prescribed in the two health centres over fifteen days. No common pattern exists between the two centres; whereas 5.5 items per patient were dispensed in Ain, 2.5 were dispensed in Khusaiba. Items such as tonics and vitamins, antispasmodics and antitussives were dispensed with wide differences between the two centres.

In Ain, out of each 10 patients 9 received antibiotics and/or tonics, vitamins or iron. In Khusaiba, out of each 10 patients 8 received antibiotics and/or tonics, vitamins and iron. The figures reflect unjustifiable over-prescription of drugs.

The differences in the number of drugs dispensed per patient in the two health centres (5.5 items in Ain and 2.5 items in Khusaiba) evidently arise from differences in the physicians' attitudes, their submissiveness to the people's demands and the availability of drugs. This is in addition to the lack of supervision and control. The large number of items dispensed for each patient is an observed pattern of practice among many physicians in the country.

Antibiotics, in the form of chloramphenicol, tetracycline, penicillin and septrin, were prescribed in large quantities and indiscriminately. Considering the short examination time, the lack of laboratory facilities for proper diagnosis and sensitivity testing and the patients' ignorance of the proper use of drugs, we can perceive the possible hazards of indiscriminate prescription of such drugs.

Table 3
Drugs prescribed in the two centres in 15 days (2373 cases)

Drug	Ain		Khusaiba	
	No.	%	No.	%
Antibiotics	1222	16.4	458	17.3
Sulpha	103	1.4	35	1.3
Tonics and vitamins	1164	15.7	208	7.9
Iron	230	3.1	161	6.1
Antispasmodic	407	5.5	6	0.2
Analgesic	638	8.6	378	14.3
Antidiarrhoeal	337	4.5	16	0.6
Antitussive	762	10.2	32	1.2
Antacid	291	3.9	191	7.2
Antiallergic	260	3.5	141	5.3
Bronchodilator	147	2.0	9	0.3
Sedative	11	0.1	79	3.0
Eye drops	317	4.2	40	1.5
Ear drops	170	2.3	43	1.6
Others	1401	18.8	851	32.1
Total	7460	100.0	2648	100.0

Preventive Services

Preventive and promotive services expected from a primary health care unit in such a community can include health education, maternal and child health care, environmental sanitation, preventive dental care, nutritional programmes and recording of statistics. None of these activities is adequately carried out.

The vaccination records are incomplete in the two health centres. From a study on the number of children vaccinated in the area it was evident that fewer than 7% of the pre-school children have received complete coverage of polio and triple vaccines.

The physician is prohibited from visiting the patients in their homes. Male physicians are not permitted by the Ministry of Health to carry out vaginal examinations; this task is left for the female practitioner or the specialists in the hospitals.

The only home visits made by the female nurses in the two centres are to attend mothers at birth. The twelve pregnant mothers who attended the Khusaiba Health Centre in one week received medicines for their present complaints. No antenatal or postnatal programme is carried out in either of the two centres. Almost no other health services are carried out by the two health centres.

Discussion

A simple analysis of the work of the health centres shows that, on average, the four physicians see a total of 158 patients a day, with an average of 2 minutes per patient. This is equal to 1.3 hours of each physician's time. It is evident that the procedure cannot have much effect on the health of the individual or the community.

If we assume that each physician spends 2 hours on administrative work in addition to the 1.3 hours spent on clinical work, he or she will be left with about 4.5 hours free time per day (8 working hours per day for 5.5 working days per week). The same could be applied to the rest of the ten health personnel in the two centres. A simple calculation indicates that total free time is 45 hours per day or 900 hours per month: ample time to operate a wide range spectrum of promotive health activities in the communities.

None of the staff in the two centres has participated in a continuous education programme or attended a medical conference, with the exception of one of the physicians who attended a 7-day seminar on 'war medicine'. None of the physicians receives medical journals or keeps a library in the clinic. They all feel the need for continuous medical education.

The physicians in the health centres have their own demands such as opportunities for continuous education, adequate financial and administrative authority and a recognition of their requests for needed drugs and medical supplies.

Changes in the Health Centres

A two-day visit was paid to the Al Asiah area 9 months after the completion of the study to collect more data and to see if any change in the health services had occurred in the two communities. Some definite improvements were observed in Ain village.

After we had left Qasim the health centre personnel moved from the old rented building to the new building which we had occupied during the time of the project. The roomy building accommodated a new X-ray machine, a small laboratory, a dental clinic and ten maternity care and emergency beds. More personnel were required to run the service.

The number of deliveries conducted by the 2 nurse-midwives in the centre increased from 3 per month to 25 per month. About 15 per month were conducted in the centre and the rest at home. The diagnostic capability of the two physicians in the centre is believed to have improved because of the laboratory and X-ray facilities.

The recent recruitment of a well-trained Arabic-speaking health officer has been another positive influence. Each new-born child in Ain now has an immunization record and a well-maintained system of follow up is being initiated. People are aware of the importance of immunization for their children. Over 50 000 tetracycline eye ointment tubes and 20 000 bottles of sulfa eye drops were distributed among the people of Al Asiah to use in the family care system campaign against trachoma. Unfortunately, no records of their actual usage are being kept.

The progress we observed in Ain village could be due to a combination of several factors almost all of which, we believe, came about as a result of our project:

- (1) The demonstration to the physicians and their staff of the practicality and need for delivering some aspect of preventive health service to the community.
- (2) The orientation of the people to their actual needs through health education programmes and their actual participation in the project.

- (3) The transfer of the health centre from the old rented building to a well-designed building, established for the purpose and with sufficient space, equipment and staff housing.
- (4) The recruitment of a well-trained, Arabic-speaking health officer to the Health Centre who has initiated immunization and sanitation programmes.

In Khusaiba village we did not observe much change in the health centre's activities, with one exception – the increased number of people demanding vaccination. There are, however, no accurate records or follow-up systems. The main difference between Ain and Khusaiba is that in Khusaiba the health centre remained in the old mud house, while in Ain the centre occupied the new building.

Conclusion

One needs little imagination to visualize the possible effect of primary health care on the people's state of health if available human resources were efficiently and effectively utilized. This could only be done if the health personnel were being well-trained, adequately oriented towards their actual role in the community and capable of activating people to participate in health programmes. In brief, health services in these two rural communities are being influenced more than anything else by the medical education received by the physicians and health personnel.

It is hoped that the Ministry of Health and the Regional Office in Qasim will make a careful study of the changes which have occurred in the health services of Ain village and use this information to reorganize the current system of primary health care.

No doubt the new trends of the Ministry of Health in the decentralization of authority, regionalization of health services, concern for health manpower development programmes and more co-ordination with the Faculties of Medicine will lead to an improvement of health service systems in the foreseeable future.

Bibliography

- Miller, D. L. and Sebai, Z. A. (1981). In: Proceedings of the 5th Saudi Medical Meeting, Riyadh, 1980. Ed. E. S. Mahgoub. College of Medicine, University of Riyadh, Riyadh; p. 69.
- Sebai, Z. A., Miller, D. L. and Ba'aqueel, H. (1980). *Saudi Medical Journal* 1, 197.

APPENDIX I

INAUGURAL ADDRESS OF DR U. KO KO
REGIONAL DIRECTOR

Distinguished participants, Ladies and Gentlemen,

It gives me very great pleasure to welcome you all to this Inter-regional Consultation on Methodologies in Health Manpower Development Research as a part of Health Systems Research.

I hardly need to reiterate to an audience such as this, that the achievement of effective health care for all must remain the basic and definitive goal of all HMD activities, including its research activities and that this should be seen as an integral part of Health Services Research. The very essence of the Health Manpower Development process is the provision of services needed for health care. Thus research in HMD must be oriented towards and indeed justified by the contribution it can make towards an improvement of health service system.

The term Health Services Research has in recent times gained wide usage. However, it remains too broad and comprehensive to be dealt with in any but a most simplistic fashion and needs, I think, to be analysed into its component parts before it can be considered in a more meaningful manner. Each part can then be looked at, and provided that there is an effective integration and synthesis of research findings, it could lead to a more comprehensive understanding of what really contributes to the strength of, or weakens and impairs, the effectiveness of our health care systems.

Every effort we make to characterize and classify the components and sub-systems of a system as complex as the health care system is fraught with some difficulties, but if we accept a more pragmatic position we can accept a categorization where the components are not independent entities rather one whose interlocking and overlapping elements contain within them the whole range of health services research. The WHO Global Advisory Committee for Medical Research views Health Services Research as the "Systematic Study of the means by which basic medical and other relevant knowledge is brought to bear on the health of individuals and communities within a given context".

A definition such as this would include several broad areas. First, studies on the health care system inclusive of areas such as assessment of needs, organization of delivery, management of organization and personnel, problems of costs, cost effectiveness and cost efficiency in relation to quality and quantum of care. Second, health manpower development, including planning and assessment of needs with reference to the required competence and distribution; planning, organization and evaluation of appropriate training programmes and the establishment of more systematic programmes of continuing education and the strengthening of team activities; problems relating to manpower management with due emphasis on problems relating to appropriate incentive schemes and career structures will have to be solved if we are to ensure that health personnel remain responsive to health care needs, dedicated to, and able to function effectively in promoting health and engaging in the prevention and care of disability and disease. Next, social, cultural and demographic factors. In this, perhaps the most undeservedly neglected area would lie problems relating to community aspirations, their value systems, life-styles and behaviours, in relation to the preservation and promotion of health.

APPENDIX I

Granted that the development target of Health for All provides the challenge, it must remain our principal point of reference and the overall goal of all involved in health care. Equally, all our research efforts must be devoted towards finding solutions to problems which impede the attainment of our goals.

Nowhere is the need for a more radical reorientation, for the development of new approaches and strategies more urgent and demanding than in Health Services Research in general and in Health Manpower Development in particular, for health personnel represent the most important and costly resource in the provision of care.

All of you, distinguished participants, will readily concede that the achievement of our goal represents a very fundamental challenge. You will concede that the formulation of our policies, the development of our plans, the adoption of our implementation strategies is currently based, often on traditional practices and assumptions which well may not bear more critical scrutiny. You will concede that we deal with a large number of variables and "unknowns" and that therefore there is a very urgent need for the kind of research which will provide the necessary basis upon which sound decisions could be made; for enquiries, the results of which can be applied to policy formulation, programming, planning and the implementation and evaluation of such policies and plans. Given this awareness, distinguished participants, why have our research efforts in these specific fields been so sparing, why have our achievements been so modest?

First, the problem of resource constraints. Admittedly the resources allocated for all health related research is small. Yet even within this allocation the resources made available for Health Services and Manpower Research are minute in comparison with that made available for the more conventional bio-medical and high technology research areas. This situation must surely serve as a reflection on priorities as they are currently perceived by decision makers. This must serve to remind us that the resistance to consider possible alternatives to present practices is one of the major constraints peculiar to applied health services research.

Second, this prevailing ethos which accords Health Services and Manpower Research lower priority than that for research in new technology is also the result of the training which many senior health professionals have themselves received, and is reflected in an orientation towards basic scientific disciplines and curative technologies, training which, in emphasizing the precision, elegance and universality of the pure sciences have albeit, inadvertently, made the conventional health professional doubtful, supercilious or at worst contemptuous of the role and validity of social and behavioural science research. As a result human resources for health services research activities in social and behavioural science areas are practically non-existent in many developing countries.

It, therefore, gives me very great pleasure to invite all you distinguished participants to this meeting, for I am aware that all of you have been willing to give us the benefit of your expertise to assist us in making a beginning to remedy this situation. The problems of health services and manpower research have been identified. The inadequacy of the experimental method in solving many of our problems of this nature have been clearly demonstrated. The imperative need of the moment is therefore a clear and lucid exposition of the alternative research methodologies which are available, with a convincing demonstration of how such methodologies could be, and have been used, to solve problems of this nature, and have indeed in some instances led to the adoption of significantly better practices.

I am confident that the outcome of your deliberations will take the form of a document which will be of invaluable benefit to all of us, not only to those of us who plan and manage research programmes, but much more to Senior Research Managers, Health Planners and Research Workers at the country level, who will gain new insights and experiences from your document and enable them to solve more competently the health care problems that are of most concern to them.

APPENDIX I

I look forward with great expectation and confidence to the outcome of your meeting and take this opportunity of thanking all of you and wishing you the very best in your deliberations. To all of you who are visiting SEARO and Delhi for the first time, a specially warm welcome, a pleasant and profitable stay and a safe and speedy voyage home.

Thank you.

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Your suggestions will be very much appreciated. Please take the time to answer the following questions.

1. How important for your work is the main theme of this book

extremely important

important

not very
important

not at all
important

2. Were the alternative research methods of interest to you?

not interesting

fairly interesting

very interesting

3. Were the methods well explained?

poorly explained

fairly well explained

very well explained

4. Were the case studies useful to present the methods?

very useful

fairly useful

not useful

5. Was the document the right length?

too short

about right

too long

6. Was the vocabulary (and the text in general) easy to understand?

easy

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difficult

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often

occasionally

never

8. Would you recommend other people in your country to read this document?

definitely no

probably no

probably yes

definitely yes

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